



# Chemistry 214, Quantitative Analysis Lab

## Summer 2021 Syllabus

**Chem 214-001, Quantitative Analysis Lab (1 credit hour)**

**Summer Session A (6-weeks): May 24<sup>th</sup> – June 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.

**Course Meeting Times:** This course is designed asynchronous (all new recorded lectures, independent videos and/or virtual labs, other activities) components that all have due dates. 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 syllabus. As a student enrolled in the course, you agree to follow and complete all course aspects including rules, requirements, virtual labs and data analysis activities, lab report, notebook entries, homework, quizzes/exams, abide by due dates, etc. set forth in this syllabus and displayed in Sakai. This course requires your full commitment so make sure to commit ~5-6 hours per week to complete the course work. All times listed are Central Standard Time (CST); all due dates are in CST regardless of the time zone you are learning in!

**Asynchronous sessions (not meeting in real-time):** Days listed as this means the class does not meet via ZOOM. Listed Panopto lab lectures should be reviewed and lab activities should be completed during the scheduled lab time but the mode of this course as asynchronous is to allow students some flexibility in when they complete the course work [i.e. if you work during the afternoon but can complete the work in the morning or evening hours, etc.]. Due dates of work must be followed regardless of when you set time aside to complete the work. Typically the lab is 4-hours, twice per week in summer. I have reduced that amount of time to 3-hours, twice per week, and based on the spring semester the students averaged needing ~6 hours per week to watch the content videos and complete the various lab work [virtual labs, data analysis, quizzes, notebook entries, lab report]. Each student learner knows their pace but I wanted to offer context based on teaching this lab in spring and time needed.

**Academic Calendar:** It is the student's responsibility to know the schedule for this course as well as the official [University Academic Calendar](#) and important dates on that calendar.

**Laboratory Coordinator:** Dr. Katrina Binaku

**Office Hours in ZOOM:** [Monday & Wednesday 12-12:40pm](#), [Tuesday & Thursday 8:30-9am](#), and by a scheduled appointment (schedule it via email). Click the links and join any time during the hours.

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

**Teaching Assistant:** Dr. Adri Lugosan

**Office Hours in ZOOM:** [Monday and Tuesday 3:30-4:00pm](#), and by a scheduled appointment (schedule it via email). Click the link and join any time during the hours.

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

### **Teaching Assistant (TA) Role:**

The function of a TA is to help the Lab Coordinator facilitate online learning content and provide help to students when necessary. Dr. Adri Lugosan is our TA for the course and is very experienced in working with me for quantitative analysis labs. TA responsibilities include but are not limited to holding weekly office hour, assisting in grading notebooks & the formal lab report, and answering student questions via email. Lab Coordinator and TA are in constant communication; we “CC” each other on student email replies. This mitigates a student emailing both the Lab Coordinator and TA with the same questions; one reply is given and is the same answer whether from Dr. Binaku or TA.

TA will not do the course work for you. TAs help students develop critical thinking and problem-solving skills. Lab Coordinator is available during and outside of class time with 4 different office hour times if there are any questions/concerns that the TA cannot handle. Students can always email the Lab Coordinator; TA is present to help answer student questions too and can be emailed any time. We are lucky to have Dr. Adri Lugosan as an additional resource in the course. Lab Coordinator has final authority in all matters relating to the course. Utilize both the Lab Coordinator and TA for help. \*If at any point you want to talk to the Lab Coordinator regarding the TA, please do. The TA should enhance the educational experience. If this is not the case, talk to Dr. Binaku.

### **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 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. Both TA and Lab Coordinator have Doctorate Degrees (PhDs) and expect to be addressed as Dr. Binaku or Dr. Lugosan, respectively. First names are not appropriate to address us with.

Welcome to Chem 214. We both look forward to having you in the course! Check Loyola email & log-in to Sakai often. **Read the syllabus to understand the course plan, expectations, and commitment needed to succeed. Commit fully, complete all required work, adhere to due dates, and know 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.

## 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 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 summer term 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 summer term 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 office hours or appts, etc. See [ZOOM participation instructions](#) supplied by the University for more info. Links to ZOOM for office hours will be provided in Sakai and are on the first page of the syllabus.
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. If you want to use a tablet to write lab notebook entries it must be “hand-written” with a stylus; notebooks cannot be typed.
9. CamScanner app, for iPhone or Android. This is a free app that will convert a phone picture to a PDF file. It is necessary to take pictures of your Composition notebook pages and upload them for grading as a PDF file. A scanner machine can also be used for this purpose.
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:**

- The asynchronous sessions are designed for you to work on assigned items for that day, instead of meeting in ZOOM. It is highly recommended to use scheduled class times to complete the work. 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 just because this course is asynchronous.
- Plan to spend at least 6 hours on the course content [watching videos, labs, data analysis, quizzes, notebook entries, lab report, etc.] each week.
- Lab lecture recordings will be posted in Panopto; recorded items will be posted early so that if students want to get ahead of the schedule they can do so with the content.
- While the lab course is a co/pre-requisite to the Chem 212 lecture course, there is zero guarantee that the content for lab will synch exactly with the lecture topics each week. Students get everything they need to succeed in this lab course from the lab content delivered.
- Lab Coordinator and TA are available during office hours (you can show up any time during the scheduled times listed on page 1), via a previously scheduled appointment in ZOOM outside of our office hours, and via email. On-campus, in person meetings with students are not possible. This course was designed far before the U.S. and States loosened their COVID-19 restrictions.
- Dr. Binaku will ask how things are going over the course of the summer session. I care a lot about students, course content, and your progress! I also have 4 office hours to be as accessible as possible!

### **General Policies:**

- Course work will be graded with an emphasis on correct significant digits, consist results (do data & observations match conclusions), correctness of calculations, data analysis and correct interpretation, or optimal instrument conditions for analyte applications, appropriate use of Excel functions, and thoroughness in responses. Following directions of reporting 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 lab notebook as a resource. Feel free to take notes from the Panopto recordings 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 and setting time aside to complete the course work. The Lab Coordinator and TAs see the lab notebook pages uploaded to Sakai as a PDF using the app mentioned, where applicable. See Grading Policy section.
- 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 Sakai 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 in the Grading Policy section.
- 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 may result in academic failure.
- Students should not enroll in courses that they cannot fully commit to. Summer sessions move fast and Dr. Binaku will support your learning; however, make sure to commit the hours needed for the work.
- Although probably not applicable, since many University activities are still 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 week of summer session. 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 the first week of summer session. 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 and no extensions will be given. Taking a vacation during summer session must comply with the same rules and regulations mentioned already, as summer courses are *optional* to participate in.

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

- Since the course is asynchronous there are no ZOOM meetings. Office hours in ZOOM are not recorded.
- Recording software called Panopto will be used to record asynchronous sessions content. The asynchronous recordings will be made available only to students enrolled in the course, via Panopto. All recordings will become unavailable to students in the class when the Sakai course is unpublished (i.e. shortly after summer session I ends, per the [Sakai administrative schedule](#)).
- 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.

- 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 in office hours or scheduled ZOOM meetings. Breakout rooms are sometimes utilized in office hours & are monitored.
- All activities pertaining to the course should be completed as an INDIVIDUAL unless otherwise specified. 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 as this is against the law. Copyright belongs to Dr. Binaku. 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. The listed websites and others readily give up student information (name, email, IP address) to Universities as evidence of cheating/posting content that does not belong to the student. Students do not have the right to post course work/materials that belongs to the Lab Coordinator.

### **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 open to those that are in the region and University computer labs are accessible but not to those that live far away. 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 [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 and modified lab procedures [for online work] serve as the basis for theory, application, instrument information, and instruction for lab experiments/activities online. PowerPoint slides are given without audio voice over to review. There is also a video recording of the PowerPoint slides, lab data, demonstrations explained, etc. in the Panopto Sakai tab that must be watched. The Panoptos always contain “extras” to help students learn, explain the data and assignments, etc. Other media for demonstration and topics includes JoVE videos, original experiment videos, virtual simulations, etc. All information and resources will be posted in Sakai.

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

All simulated lab experiments, activities, and/or data analysis are completed *individually (unless otherwise noted)*, 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 theory and information for how the data was collection. Each student [or partnership] 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 a face-to-face laboratory; 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. The online course work will help you learn the techniques, gain understanding of the data, and draw conclusions. This is of utmost important as in the real-world, companies train you on the instruments themselves but expect employees to know calculations and understand the type of data the instrument produces, and be able to interpret data and what it reveals.

Lab experiments/activities and the resources will be organized by Lessons folders. Each day 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 Lab Coordinator/TA questions during office hours or via email to comprehend the tasks at hand before submitting the work for grading. Grades for this work are based on correctness of data processing and interpretation of results.

If the Lab Coordinator 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. If a student finds a mistake in their own work and has to request to Lab Coordinator that an additional submission be granted, a **deduction** is applied to the grade. Therefore, try to ask Lab Coordinator 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 too [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. Students who have tablets with a stylus can use digital notebook taking if it is handwritten with a stylus. Lab notebook pages cannot be typed at all.

*The following four (4) lab experiments/activities require a formal lab notebook entry (this is also noted in the lab schedule):*

Acid-Base Titration (KHP and NaOH)

Polyprotic Acid

HPLC part 1 and HPLC part 2 (combined)

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

If the lab data has Excel components you do NOT have to put Excel work 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 Report:**

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. There is only 1 lab report this summer term. 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 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 [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 completing lab reports is labor intensive. **Students will only write a lab report for one (1) of the lab experiments/activities in this course. The lab experiment for which a written lab report is required is Acid-Base Titration (KHP and NaOH Titration Experiment).**

To assist students in improving writing skills and address any deficiencies, this lab report (only), Acid-Base Titration, may be revised after the first version has been graded to receive at most ½ the lost points back. Discuss any questions or concerns about graded lab reports and revisions before the lab report revision is due.



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

There will be a short quiz on the content for some lab experiments/activities. *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 certain time period according to the lab schedule, then close and cannot be re-opened. There is no timer once inside the quiz. **Take it as an individual (no help from others). 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 both sections [001 and 002] take the quiz and it closes.** If you complete a quiz early, you won't see a grade/feedback until all students complete it. Absent/ill students do not get extensions on quiz deadlines. 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 summer session. 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. Recognize summer courses are accelerated and not all accommodations are applicable. 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 analysis, answers to quiz questions, sharing files, or completing Sakai work or other electronic content with another person. The data and analysis, homework, quizzes, 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 students' (current or previous) work and presenting it as one's own is unacceptable. There is a difference between sharing knowledge and cheating. If any graded materials in this course are plagiarized or have been shared between students, no credit will be given for the work in question. Suspected academic dishonesty are 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](#) 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 1 extra credit opportunity in Chem 214 [an Intro Forum]. No other extra credit is offered because, frankly, there is nothing of the sort in the “real world.” If you do not turn in work for 3 or more lab experiments/activities, you cannot pass the course [I have to report you to the Dean’s Office, the Wellness Center, and academic advisor].

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 0 is the final grade. Quizzes cannot be accessed after the due date.

**NOTEBOOK ENTRIES:** If not completed on time, a 48-hour grade period is allotted to turn it in late [2pt penalty per day of lateness applied to grade]. After 48-hours, if work is not turned in 0 is the final grade.

**LAB ACTIVITY/DATA ANALYSIS:** If not completed on time, a 48-hour grade period is allotted to turn it in late [3pt penalty per day late applied to grade]. After 48-hours, if work is not turned in 0 is the final grade.

**LAB REPORT:** If not completed on time, a 48-hour grade period is allotted to turn the work in late [5pt penalty per day of lateness applied to grade]. After 48-hours, if the lab report is not turned in a 0 is the final grade.

**SOCIAL JUSTICE FORUM:** The forum will be open almost the entire 6 weeks of the summer course. Once the forum closes it cannot be accessed. Late postings won’t be accepted nor possible.

Be advised summer classes are accelerated. The schedule, due dates, and amount of grace offered to late work takes that in to account. As a student in this course, you agree to abide by all due dates and understand grades will suffer if work is not turned in on time. Grace periods are offered because Lab Coordinator realizes sometimes life happens. Any course work due in week 6 [the last week of classes] cannot be accepted late since final course grades must be calculated and entered in LOCUS by early day on July 2<sup>nd</sup>.

The point breakdown of every item in the course is on the next page. Students can use this as a guide when navigating through the 6-week course and the requirements. Due dates & times for these items are at the end of the syllabus in the course schedule.

Activity Type	Origin or Sakai (Location of Submission)	Points	Weighted % of Final Grade
<b>DATA ANALYSIS / PROTOCOLS / INSTRUMENT OPTIMIZATIONS</b>			
Week 1 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 2 LAB: Polyprotic Acid Titration (Data Analysis) Notes: students get unique raw data via email and must process, graph, & interpret it. Submit final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 3 LAB: Buffers (Protocols) Notes: Students watch JoVE video on how to prepare a buffer. Type up detailed protocol based on that video.	Word Doc or PDF submitted to Sakai (Assignments)	100	
Week 3 LAB: HPLC part 1 & 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 4 LAB: Ion Chromatography (Data Analysis) Notes: students get unique raw data via email and must process, graph, & interpret it. Submit final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 4 LAB: Gas Chromatography (Simulation, Instrument Optimizing) Notes: Students work in the simulation and try various parameters. Document all results via screenshots, answer analysis questions, submit ALL parameters and answers.	Excel or Word Doc or PDF submitted to Sakai (Assignments)	100	
Week 5 LAB: UV-Vis: Ext. Std., Iron Analysis (Data Analysis) Notes: students get unique raw data via email and must process, graph, & interpret it. Submit final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 5 LAB: UV-Vis: Ext. Std & Standard Addition, Artificial Dye (Data Analysis) Notes: students get unique raw data via email and must process, graph, & interpret it. Submit final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	
Week 6 LAB: ATR-IR (Data Analysis) Notes: students get unique raw data via email and must process, graph, & interpret it. Submit final file with all analyses, results.	Excel File submitted to Sakai (Assignments)	100	

Activity Type	Origin or Sakai (Location of Submission)	Points	Weighted % of Final Grade
<b>QUIZZES</b>			
Quiz on Syllabus and Course Policies	Sakai (Tests & Quizzes)	20	<b>20%</b>
Quiz on Microsoft Excel and Stats	Sakai (Tests & Quizzes)	20	
Quiz on Polyprotic Acids	Sakai (Tests & Quizzes)	20	
Quiz on Buffers	Sakai (Tests & Quizzes)	20	
Quiz on Chromatography (HPLC, IC, GC)	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 & 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 1 and closes in Week 6	Sakai (Forums)	20	<b>5%</b>
<b>LAB REPORTS (typed and submitted as Word or PDF file)</b>			
WEEK 2: Formal Laboratory Report 1, typed: Acid-Base Titration [PDF or Word Doc]	Sakai (Assignments)	200	<b>15%</b>
			<b>100%</b>

**\*The Introduction Forum listed in Week 1 is worth 5 points extra credit.** It facilitates a way for you to get to know your classmates, Lab Coordinator, and TA so I do encourage you to participate. This is the only extra credit opportunity offered in the course. This forum will close at the beginning of class in Week 2.

## Lab Report and Notebook Grading Rubrics:

Lab Report Sections	Points
Title Page	20
Introduction/Purpose	45
Results and Data	50
Discussion	30
Conclusion	20
Grammar/Formatting/Spelling	25
Proper File Type (Word or PDF) and Location Submission (Sakai)	10
<b>Total</b>	<b>200</b>

Notebook Entries (Each notebook entry is graded with this rubric)	Points
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 summer session, students will receive an email from the Office of Institutional Effectiveness with a reminder to give 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 course 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 TA 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 summer session. Students will be notified if any changes have been made.

**COPYRIGHT DISCLAIMER: All portions of the Chem 214 syllabus, course materials in Sakai (PowerPoints, Panoptos, all handouts (Word or PDF), rubrics, lab directions, lab videos, experiment data) 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 SUMMER TERM. Note the course is built to be ASYNCHRONOUS (work assigned but not meeting in ZOOM). This gives students flexibility to work ahead and around any employment, club, or other commitments. Lab Coordinator highly suggest students use the listed times in LOCUS to complete the course work. As a reminder, expect to spend 6-7 hours per week on the course work although this may vary based on abilities and course work type.

Tentative Chem 214 Summer I Session Schedule

WEEK & Class Dates	Meeting Type	Lecture and/or <i>Lab Activity/Homework*</i> ( <i>type of work in italics</i> )  *activity opens on the class day it is listed	<i>Activity /Homework Due Dates</i>
<b>WEEK 1</b>			
<b>Monday, May 24</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Intro &amp; Syllabus Lecture Glassware &amp; Safety Lecture Sakai Demo</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>Find blank calculation review sheet in Resources and complete it [self-assessment on your skills]. Upload calculation review work as a PDF to Sakai (Assignments)</i></p> <p><i>Read over the syllabus in Sakai (Syllabus)</i> <i>Explore features of the course Sakai site.</i></p> <p>Sakai Introduction Forum (<i>Forums</i>). The only e.c. opportunity. Closes beginning of Week 2.</p> <p style="color: green;"><i>Quiz on Syllabus &amp; Course Policies (Tests &amp; Quizzes)</i></p>	Homework listed on Mon. is DUE on Wednesday, May 26 <sup>th</sup> by 12:30pm
<b>Wednesday, May 26</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Importance of a Lab Notebook Lecture Excel Modules (Basics, Calcs &amp; Stats, Graphing, Etc.) Lecture/Demonstration</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 1: Penny Statistics in Excel.</i></p> <p><i>Submit finished lab work Excel file to Sakai (Assignments)</i></p> <p style="color: green;"><i>Quiz on Microsoft Excel &amp; Stats (Tests &amp; Quizzes)</i></p> <p style="color: orange;"><i>Social Justice Forum (Forums) opens and remains open until beginning of Week 6.</i></p>	Homework listed on Wed. is DUE on Tuesday, June 1 <sup>st</sup> by 12:30pm.  YES homework is due on the day after the holiday. <b>Be advised.</b>
<b>See next page for Week 2</b>			

WEEK & Class Dates	Meeting Type	Lecture and/or Lab Activity/Homework* (type of work in italics) *activity opens on the class day it is listed	Activity /Homework Due Dates
<b>WEEK 2</b>			
<b>Monday, May 31</b>	MEMORIAL DAY, NO CLASSES  Make-up day is Friday June 4 <sup>th</sup>	According to the <a href="#">Official University Calendar</a> you must be advised that because TODAY is a Holiday, you are required to do work on Friday, June 4 <sup>th</sup> , the scheduled make up day for Memorial Day observance.	Can get a head start on Wednesday work if you want to
<b>Wednesday, June 2</b>	Asynchronous	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Acid-Base Titration Lecture Writing Lab Reports Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 2: Weak acid-strong base titration (KHP and NaOH) video in Panopto; gather appropriate data from videos. Compute calculations and interpret results, which will be a part of the lab report.</i></p> <p style="text-align: center;"><i>Notebook Entry for Acid-Base Titration (Assignments)</i></p> <p style="text-align: center;"><i>Formal Lab Report for Acid-Base Titration (Assignments)</i></p>	Homework listed on Wed. is DUE on Wednesday, June 9 <sup>th</sup> by 12:30pm  (gave you 1 week to write the lab report, be mindful of time)
<b>Friday, June 4</b>  <b>Make up day for Memorial Day observance</b>	Asynchronous	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Polyprotic Acid Titration Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 3: Polyprotic acid sample data. Raw data emailed to student groups. Process and interpret results.</i></p> <p style="text-align: center;"><i>Submit finished Excel file of lab results to Sakai (Assignments)</i></p> <p style="text-align: center;"><i>Notebook Entry for Polyprotic Acid Titration (Assignments)</i></p> <p style="text-align: center;"><i>Quiz on Polyprotic Acids (Tests &amp; Quizzes)</i></p>	Homework listed on Fri. is DUE on Monday, June 7 <sup>th</sup> by 12:30pm  YES this work is due before the lab report is due.



WEEK & Class Dates	Meeting Type	Lecture and/or Lab Activity/Homework* (type of work in italics) *activity opens on the class day it is listed	Activity /Homework Due Dates
<b>WEEK 3</b>			
<b>Monday, June 7</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content In Panopto:</b> Buffers Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 4: Type up a buffer preparation protocol after watching the JoVE video content on creating a buffer.</i></p> <p style="text-align: center;"><i>Submit buffer write up as Word or PDF file to Sakai (Assignments)</i></p> <p style="text-align: center;"><i>Quiz on Buffers (Tests &amp; Quizzes)</i></p>	Homework listed on Mon. is DUE on Wednesday, June 9 <sup>th</sup> by 12:30pm
<b>Wednesday, June 9</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> High-Performance Liquid Chromatography (HPLC) Lecture HPLC Simulator Excel File Demo HPLC Online Simulator Demo</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 5: HPLC part 1, Excel File simulation of HPLC chromatograms. Follow the directions to see how different settings change the separation. Take screenshots of all results/instrument conditions in the activity.</i></p> <p><i>LAB 6: HPLC part 2 Excel File simulation. Follow directions to see how settings change separations. Take screenshots of simulation results each time a variable is changed.</i></p> <p style="text-align: center;"><i>Submit Word Doc and/or Excel file with the data tables of instrument conditions OR the screenshots of simulation results to Sakai (Assignments)</i></p> <p style="text-align: center;"><i>Notebook Entry for HPLC part 1 and HPLC part 2 online simulation submitted together, i.e. one PDF file for both activities (Assignments)</i></p>	Homework listed on Wed. is DUE on Monday, June 14 <sup>th</sup> at 12:30pm
<b>See next page for Week 4</b>			

WEEK & Class Dates	Meeting Type	Lecture and/or <i>Lab Activity/Homework*</i> ( <i>type of work in italics</i> ) *activity opens on the class day it is listed	Activity /Homework Due Dates
<b>WEEK 4</b>			
<b>Monday, June 14</b>	<i>Asynchronous</i>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Ion Chromatography (IC) Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 7: Sample data of IC water analysis. Raw data sent to each student via email. Process data and interpret results.</i></p> <p style="text-align: center; color: red;"><i>Submit finished Excel file to Sakai (Assignments)</i></p>	Homework listed on Mon. is DUE on Wednesday, June 16 <sup>th</sup> by 12:30pm
<b>Wednesday, June 16</b>	<i>Asynchronous</i>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Gas Chromatography (GC) Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 8: GC online simulation. Create data tables for instrument conditions or screenshots of conditions used AND results. Include all trials.</i></p> <p style="text-align: center; color: red;"><i>Submit Word Doc and/or Excel file with the data tables of all trials and instrument conditions to Sakai (Assignments)</i></p> <p style="text-align: center; color: green;"><i>Quiz on General Chromatography Principles for HPLC, IC, and GC (Tests &amp; Quizzes)</i></p>	Homework listed on Wed. is DUE on Monday, June 21 <sup>st</sup> at 12:30pm
		<b>See next page for Week 5</b>	

WEEK & Class Dates	Meeting Type	Lecture and/or <i>Lab Activity/Homework*</i> ( <i>type of work in italics</i> ) *activity opens on the class day it is listed	<i>Activity/Homework Due Dates</i>
<b>WEEK 5</b>			
<b>Monday, June 21</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Spectrophotometry Basics, UV-Vis External Standards, Iron Analyte Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 9: 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 style="text-align: center; color: red;"><i>Submit finished Excel data file with all values, calculations, and graph to Sakai (Assignments)</i></p>	Homework listed on Mon. is DUE on Wednesday, June 23 <sup>rd</sup> by 12:30pm
<b>Wednesday, June 23</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> UV-Vis Ext. Std. and Standard Addition, Artificial Dye Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 10: Sample data of UV-Vis standards and sample analysis with artificial dye. Raw data sent to student groups via email. Process data and interpret results.</i></p> <p style="text-align: center; color: red;"><i>Submit finished Excel data file with all values, calculations, and graphs to Sakai (Assignments)</i></p> <p style="text-align: center; color: blue;"><i>Notebook Entry for UV-Vis Ext. Std. &amp; Standard Addition, Artificial Dye (Sakai Assignments)</i></p> <p style="text-align: center; color: green;"><i>Quiz on UV-Vis (Tests &amp; Quizzes)</i></p>	Homework listed on Wed. is DUE on Monday, June 28 <sup>th</sup> at 12:30pm
		<b>See next page for Week 6</b>	

WEEK & Class Dates	Meeting Type	Lecture and/or <i>Lab Activity/Homework</i> * ( <i>type of work in italics</i> ) *activity opens on the class day it is listed	Activity /Homework Due Dates
<b>WEEK 6</b>			
<b>Monday, June 28</b>	<b>Asynchronous</b>	<p style="text-align: center;"><b>Lecture Content in Panopto:</b> Using Attenuated Total Reflectance – Infrared Spectroscopy (ATR-IR) Lecture</p> <p style="text-align: center;"><b>Homework (all items listed below):</b> <i>LAB 11: Sample data of standards and sample analysis using ATR-FTIR. Raw data sent to student groups via email. Process data and interpret results.</i></p> <p style="text-align: center; color: red;"><i>Submit finished Excel data file with all values, calculations, and graphs to Sakai (Assignments)</i></p>	Homework listed on Mon. is DUE on Wednesday, June 30 <sup>th</sup> by 3:30pm
<b>Wednesday, June 30</b>	Synchronous in ZOOM if any grading questions for Dr. Binaku, otherwise <b>Asynchronous and not required to attend</b>	<p style="text-align: center;"><b><u>LAST DAY OF CLASS</u></b></p> <p>Grad School / Job Info Tips Lecture (optional to watch if interested) Wrap up Chemistry lab concepts Panopto Last Minute Questions on Course or Grades (join the class ZOOM link)</p> <p>Sakai TA Evaluation (Tests &amp; Quizzes)</p> <p><b>All grading questions must be resolved in ZOOM Breakout Rooms during scheduled class time. Grades are final and put in LOCUS today after class time per University deadlines in place due to summer II session.</b></p>	<p>You are done with class! <b>BRAVO 😊</b></p> <p>ASK ANY last-minute questions during class in ZOOM. Emailed questions after class time is over cannot be addressed.</p>