

# Chemistry 212-001, Quantitative Analysis Lecture

## Summer 2019 Syllabus

**Chem 212-001, Quantitative Analysis Lecture (3 credit hours), May 21<sup>st</sup> through June 27<sup>th</sup>, 2019**  
**Meets on Tuesdays, Wednesdays, & Thursdays 8:30 am – 11:10 am in Dumbach Hall, Room 117**

**Prerequisite:** Chem 106 or Chem 102 & 112

**Course Instructor:** Dr. Katrina Binaku

Office: Flanner Hall 104 Phone: (773) 508-8715

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

Office Hours: Tuesdays 11:20am – 12:30pm OR by a scheduled appointment. Location is my office.

**When sending emails put *Chem 212-001* in the subject line or there will be a delay in my reply.** Any weekday emails sent after 8:45 pm will not be replied to until the following morning. Do not wait until the last minute to email with questions. I check email twice a day on weekends but respect the fact that email replies take longer on the weekend [up to 24-hours] as I am not at a computer 24/7.

### Course Description:

This course focuses on the fundamental aspects of analytical chemistry from experiment design, calculations, statistics, acid/base chemistry, redox chemistry, electrochemistry, and ionic equilibria, etc. Theory of techniques and applications used in biomedical, forensic, environmental chemistry, etc. will also be highlighted during the course.

### Course Goals & Outcomes for Students:

- Acquaint students with some of the classical and modern techniques in analytical chemistry
- Teach chemical equilibrium, acid/base chemistry, buffers, titrations, redox chemistry, and other chemical theory
- Review conventional data collection methods, interpretation, evaluation of experimental data

By completing Chem 212, students will be able to:

- List 3 classical and 3 modern analytical techniques and distinctly explain them.
- Demonstrate proficiency in chemical equilibrium, acid/base chemistry, redox chemistry and other chemical topics [covered this term] through completion of chapter homework problems.
- Demonstrate proficiency in evaluation of accuracy/precision of data using basic statistics

### Required Materials:

- *Exploring Chemical Analysis*, 5<sup>th</sup> Edition by Daniel C. Harris (hard-copy or e-Text, older edition ok too) AND *Sapling Exploring Chemical Analysis 6 months Access Card*. ISBN-13: 9781319090180 **OR** If you already have a textbook, buy just the *Sapling Exploring Chemical Analysis 6 months Access Card* (LUC bookstore or Sapling, comes with e-Text) ISBN-13: 9781319088859
- *Inexpensive calculator* for logarithmic (base 10 and base e), exponential, trigonometric functions **OR** a graphing calculator [cannot be a model that has internet, WIFI, or texting features]. Cell phone/tablet/laptop or other electronic devices are NOT calculators and cannot be used.
- *Sakai* is used to post grades and other course material (syllabus, instructor information, discussion keys, etc.). Check Sakai daily. If a student is unfamiliar with Sakai, talk to Instructor.

Read the textbook as supplement to what is covered in lecture. Major points are discussed in lecture and the textbook enhances the material. Emphasis of this course is understanding the material, not memorization. Achieve understanding in lecture, outside independent review/practice, Sapling, exams.

**Attendance Policy:**

**It is expected students attend every scheduled lecture class and are *on time!*** See schedule on page 6. Understanding the demands of summer school is a student's responsibility. Students elect to take summer courses, which are optional; therefore, students' schedule must commit 100% to the course's scheduled days/time documented in LOCUS. Do not be absent on days of exams; if you choose to be, you are required to make-up the exam within 24 hours of the exam date so if you have to stay late or come in the next day [outside of class time] you must. If a make-up exam is not completed within 24 hours it is an automatic zero (0) out of 125, an F. If you miss more than one exam, you will be reported to the University, your academic advisor, and the Wellness Center and the Instructor will not offer a make-up if more than one exam is missed; it will be an automatic zero (0). No make-ups offered for the final exam. **Discussion worksheets cannot be made up; if a student is absent for a discussion worksheet, the student earns a zero**, no exceptions and no alternatives! Students are required to initial a sign-in sheet each day of lecture, documenting/verifying their attendance. The sheet serves as formal record. If an absence does occur, it is an absent student's responsibility to contact the Instructor.

**Blanket statement about "technical difficulties:"**

It is *strongly encouraged* that all required online Sapling Homework, opening course/data or other applicable files in Sakai, or other be done on a reliable wired internet connection [not wireless], that of which the University itself provides in the Information Commons and various computer labs on the Lake Shore Campus. Under NO circumstances will excuses of "technical difficulties" be accepted as this syllabus is stating all students should use a wired internet University computer [not wireless internet] to submit work in Sapling Homework online, open course/data or other applicable files, view or download items from Sakai, etc. 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. Use of home internet [wired or wireless], University wireless, or public wireless is at your, the student's, own risk. It is not prohibited but as the Instructor has stated in this syllabus, the Instructor is not responsible for ANY technical difficulties of non-University devices [cell phone, tablet, home/work/public wireless internet or computer]. The Instructor will not accept any excuses of the sort. Do not submit items using a cell phone or tablet device. These are not reliable internet connection tools.

**Academic Honesty:**

Academic dishonesty in this course will not be tolerated. The Instructor encourages students to converse with each other about chemistry outside of the classroom. Group study sessions as well as practicing end of chapter questions in the textbook with others is appropriate and encouraged. However, the Sapling (online) homework must be completed individually; it is not group work.

There is a difference between sharing knowledge and cheating. Copying others work and presenting that work as one's own is an example of academic dishonesty. Cheating and plagiarism take many forms. Academic dishonesty during an exam can take many forms, including but not limited to: sharing materials/information with another student during the exam, looking at another student's quiz/exam sheet, talking, sharing a calculator, using a cell phone, using lecture notes, etc. This list is not exhaustive but highlights several dishonest situations. Copying a student's discussion worksheet answers is another form of cheating. If it is determined that course materials are plagiarized or shared by students (current

or past), no credit will be given for the work in question. Sapling (online) Homework must be completed as an individual. Cases of suspect academic dishonesty will be handled according to University policy.

**Review Loyola University Chicago's policy on Academic Integrity:**

[http://www.luc.edu/academics/catalog/undergrad/reg\\_academicintegrity.shtml](http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml)

**Services for Students with Disabilities (SSWD)/Student Accessibility Center (SAC) Policy:**

Necessary accommodations will be made for students with disabilities who procure a SSWD/SAC letter. Do discuss your academic needs with the Instructor as soon as possible! To receive accommodations self-disclosure, proper documentation, and registration with SSWD/SAC at Loyola University Chicago is required. Accommodations cannot be made until the Instructor receives proper documentation. Furthermore, accommodations are not retroactive; they begin only once appropriate documentation has been received by the Instructor in a timely manner. Only accommodations specifically listed in the formal letter will be provided. Policies: <https://www.luc.edu/sac/about/>

**Exams:**

There will be a total of three one-hour exams given during the semester and a cumulative final exam. Exams #1, 2, and 3 are each worth 125 points. Exams begin promptly at 8:30 am; students who are late to class lose time, as extra exam time for late students is not granted. **Students must take all exams on the assigned dates noted in the syllabus.** If you are absent for one of the three one-hour exams, you have 24-hours from the start of the assigned exam date to take a make-up exam or you receive a 0 out of 125 points for that particular exam. If you are absent again, for a second exam, a make-up is not offered, you earn a 0, and you are reported to the University, your academic advisor, and the Wellness Center. **The final exam is cumulative. No make-up exams are granted for the final exam under any circumstances!** Students are not allowed to take the final exam early. If a student does not show up on the final exam day [Thursday, June 27, 2019] to take the final exam at the scheduled course start time of 8:30 am, the student receives a zero (0) for the final exam. There is *no* make-up final exam. **All exams are closed book, closed note unless otherwise specified.** Graphing/scientific calculators *are* allowed but calculators with internet/WIFI/texting capabilities are not. Calculators cannot be shared by students. It is the student's responsibility that their calculator is in working order. The cover of the calculator must be removed and not be in plain view. A periodic table will be provided. Cell phones/tablets/computers do NOT count as calculators and cannot be used.

Exam materials *must be handed directly* to the Instructor after completion of an exam. This verifies the student's attendance and completion of the exam. Exams are graded as soon as possible. Students' exams and/or answer sheets are photocopied. Any discrepancies or questions about grading on any one-hour exams (#1, 2, and 3) must be discussed with the Instructor no later than two business days after the graded exam has been returned to the student. After two business days of students having a graded exam in their possession, no grading changes will be made on exams. No exceptions. The final exam will be graded by Monday July 1<sup>st</sup>, 2019. Students can stop by July 1<sup>st</sup> from 9-10am to see the graded final exam. After said time/date graded final exams are sealed and can no longer be viewed.

<b>Exam Dates:</b>	Wednesday, May 29, 2019	Exam #1, Chapt. 0,1,3-6 (one hour, 8:30 – 9:30 am)
	Tuesday, June 11, 2019	Exam #2, Chapt. 8-11,13 (one hour, 8:30 – 9:30 am)
	Thursday, June 20, 2019	Exam #3, Chapt. 12,14,16,18-20 (one hour, 8:30 – 9:30 am)
	Thursday, June 27, 2019	Cumulative Final Exam (2 hours, 8:30 – 10:30 am)

*Tutoring:* To get more information on the Loyola University Tutoring Center visit [www.luc.edu/tutoring](http://www.luc.edu/tutoring). Chemistry is fascinating but challenging. Conscious, daily studying must be done to master principles taught in this course. Contact me if persistent troubles arise. Use office hours, tutoring center to help clarify subject matter/other questions. Do end of chapter textbook problems for extra practice!

### **Sapling Learning (Online) Homework:**

There are REQUIRED Sapling Learning (online) Homework problems assigned for each chapter covered. *They ARE graded* and meant for practicing the material [by no means is it the only 'practice' available, there are end of chapter textbook problems]. LATE Sapling homework submissions are not accepted; if homework is incomplete and the due date passes, the points earned are zero (0). Students cannot get credit for things not completed on time. Due dates are below and are non-negotiable; I assign due dates to keep students on track, completing homework problems little by little over the course's duration.

<b>Chapters</b>	<b>Due Date (by 11:55 pm / 23:55)</b>
Practice, 0,1	Tuesday, May 28 <sup>th</sup> , 2019
3,4,5	Wednesday, May 29 <sup>th</sup> , 2019
6,8,9	Saturday, June 8 <sup>th</sup> , 2019
10,11,13	Sunday, June 16 <sup>th</sup> , 2019
12,14,16,18	Tuesday, June 25 <sup>th</sup> , 2019
19–23	Thursday, June 27 <sup>th</sup> , 2019

The "Practice Assignment" in Sapling is 5 points extra credit. It opens Tuesday, May 21, 2019 at 11:10 am and closes Tuesday, May 28, 2019 at 8:30 am. After close time, stated here in the syllabus & Sapling, the extra credit is no longer available. If a student neglects to complete the extra credit within the defined period, no extra credit points (e.c.) are earned nor other e.c. given. No exceptions.

*Directions to access Sapling Learning (online) Homework, Sapling provided these to Instructors:*

1. Go to [www.saplinglearning.com/login](http://www.saplinglearning.com/login) to create an account. If you already have a Macmillan Learning account you can log in with your existing credentials and skip to step 3.  
Create your password and set all three security questions. Start typing in your institution to select from the options that appears in the Primary Institution or School name field. If your institution does not appear you can add it by typing in the full name. Accept the terms of use and click "Sign Up". Check your email for the confirmation link to complete registration and return to login page.
2. Set your institution by searching using your institution's full name and selecting the appropriate option.
3. Under Enroll in a new course, you should see Courses at [Your College]. Click to expand this list and see courses arranged by subject. Click on a subject to see the terms that courses are available.
4. Click on the term to expand the menu further (note that Semester 1 refers to the first course in a sequence and not necessarily the first term of the school year).
5. Once the menus are fully expanded, you'll see a link to a specific course. If this is indeed the course you'd like to register for, click the link.
6. *If applicable*, to access your ebook click on the image of the cover on the right sidebar of your course site.

**Need Help?** The technical support team can be reached by phone, chat, or by email via the Student Support Community. To contact support fill out the webform: <https://macmillan.force.com/macmillanlearning/s/> **Sapling Learning support team is faster and usually better able to resolve technical issues than the Instructor.**

This link includes detailed instructions on how to register for your course:  
<https://macmillan.force.com/macmillanlearning/s/article/Sapling-Learning-Registering-for-courses>

**In-class Discussions:**

During most of the lectures, there will be a discussion period (~13). No discussions will be held on days of exams [just exam and lecture materials on those days]. Group work between students is encouraged through several sample questions, each group working on answering questions pertaining to the topic at hand. This is a part of class participation; students will turn in their group work on discussion sheets with group member names. The calculations/answers will be looked over for “good faith” effort. Group members are awarded 3 points each for the day’s discussion worksheet. Absent students, whom are not present to participate, earn a zero (0) out of 3 points for that day’s in-class discussion worksheet. Discussion work cannot be made up outside of class time if absent. Absent students can get a blank copy of the worksheet they missed in order to practice the material, but it will not be worth any points.

**Grading Policy:**

The established grading policy is subject to change at Instructor discretion. Please note the University uses a +/- grading scale system and it will be implemented in this course. 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. There is no extra credit assignments in Chem 212 (other than the 5 points in Sapling). Course grades will be entered in LOCUS on Monday, July 1<sup>st</sup> at 10:05 am, after the offered viewing period of graded final exams ends.

<b>Grading Category</b>	<b>Points</b>
Sapling (online) Homework	<b>106</b>
In-class Discussion worksheets	<b>39</b>
Exam #1 (one hour)	<b>125</b>
Exam #2 (one hour)	<b>125</b>
Exam #3 (one hour)	<b>125</b>
Cumulative Final Exam (two hours)	<b>150</b>
<b>Total</b>	<b>670</b>

The scale to determine the letter grade earned in the course is as follows:

**A** 100–93%, **A-** 92–89%, **B+** 88–85%, **B** 84–81%, **B-** 80–77%, **C+** 76–73%, **C** 72–69%, **C-** 68–66%, **D+** 65–63, **D** 62–59%, **F** ≤ 58%

**Norms of Course Proceedings:**

The classroom is a safe place to question and explore ideas involving chemistry! Student and Instructor voices are important to this work. Feel comfortable asking questions during lecture/discussion, office hours, etc. If disagreements arise with respect to an exercise answer or a topic of discussion, remember to respect fellow peers when proceeding to offer explanations or points of view.

Class sessions begin/end on time. Students should attend all class sessions and actively participate. Missing even one class puts a student significantly behind in terms of knowledge. If an absence is anticipated, discuss this with the Instructor as soon as possible.

Envision the following for lectures: class will promptly begin at 8:30 am, starting with a ~50 minute lecture, followed by a 5 minute break, then a ~40 minute discussion/group work (sample problems, students ask questions, group work on practice problems, etc.), a 5 minute break, and finally a ~60 minute lecture. This plan is not guaranteed because as we all know, sometimes things in life do not always go according to plan; the timing may fluctuate depending on topic or pace of the class.

### Chem 212-001 Tentative Lecture Schedule (subject to change\*)

<u>Date</u>	<u>Day</u>	<u>Chapter</u>	<u>Lecture Topics</u>
5/21	T	0, 1	Chemical Analysis; Terms; Stoichiometry; Units; Conversions Review
5/22	W	3, 4	Math Tools; Sig Figs; Errors; Statistics
5/23	Th	5, 6	Quality Assurance and Calibration Methods; Titrations
5/28	T	6, 8	Finish Titrations; Acids & Bases
5/29	W	8	<b>Exam #1</b> (Ch. 0,1,3,4,5,6); Lecture on Acids & Bases
5/30	Th	9	Buffers
6/4	T	10	Acid/Base Titrations
6/5	W	10, 11	Acid/Base Titrations; Polyprotic Acids and Bases
6/6	Th	13	EDTA Titrations
6/11	T	12	<b>Exam #2</b> (Ch. 8,9,10,11,13); Lecture on Chem Equil., Ionic Strength
6/12	W	14	Electrode Potential
6/13	Th	16	Redox Titrations
6/18	T	18, 19	Light; Absorption; Beer's Law; Spectrophotometry; Instrumentation
6/19	W	20, 21	Atomic Spectroscopy, Instruments: Chromatography
6/20	Th	21	<b>Exam #3</b> (Ch. 12,14,16,18,19,20); Lecture on Chromatography and MS
6/25	T	22, 23	Chromatography; Gas, Liquid Chromatography; Components GC or LC
6/26	W	23	Gas, Liquid Chromatography; Ion Chromatography; Review if time
6/27	Th	N/A	<b>Cumulative Final Exam</b> ; Last Day of Class!

\*This guideline is based on previous experience of my teaching the course. The schedule is subject to change at the Instructor's discretion based on pace of the class. Six weeks will fly by and we have a lot of chemistry to cover! NOTE: I will not change exam dates under any circumstances. Instructor reserves the right to change/modify, correct any errors [if present] that are found in the syllabus at any time during the duration of the summer session. If this occurs, students are notified.

#### IDEA (Individual Development and Educational Assessment):

IDEA is the course/instructor evaluation. *Essential* and *Important* objectives have been selected by the Instructor, representing goals/development to be achieved during and because of course completion.

##### *Essential objectives:*

1. Gaining factual knowledge (terminology, classifications, methods, trends)
2. Learning to apply course material (improve thinking, problem solving, making decisions)

##### *Important objectives:*

4. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course

*Towards the end of the semester, you are sent an email requesting completion of the IDEA course/instructor evaluation for Chem 212-001. The objectives will be discussed the first day of class.*