

# Chemistry 212-001, Quantitative Analysis Lecture

## Summer 2016 Syllabus

**Chem 212-001, Quantitative Analysis Lecture (3 credit hours), May 23<sup>rd</sup> through July 1<sup>st</sup>, 2016**  
**Meets on Mondays, Wednesdays, & Fridays 12:30 pm – 3:10 pm in Mundelein Center, Room 609**  
\*Note, there will NOT be class on Memorial Day, Monday, May 30<sup>th</sup>, 2016.

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

**Instructor:** Dr. Katrina Binaku

Office: Flanner Hall 104

Phone: (773) 508-8715

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

Office Hours: Mondays 3:30-5 pm, Thursdays 1-2 pm, and by appointments *scheduled* in advance.

When sending emails put Chem 212-001 in the subject line. Any emails sent after 8:30 pm will likely not be replied to until the following morning. I do check email on weekends but do respect that email replies may take longer as I am not at a computer 24/7.

### **Course Objectives/Description:**

- 1) To teach fundamental aspects of acid/base chemistry, redox chemistry, electrochemistry, and ionic equilibria. Basic statistics will also be discussed.
- 2) To acquaint the student with some of the fundamental techniques and state-of-the-art applications of chemical quantitative analysis used in biomedical, forensic, and environmental chemistry, to name a few.

Use/read the textbook as a supplement to what is covered in the lecture. There is a lot of information at hand. The major points are discussed during lecture; the textbook enhances the material presented. The emphasis of this course is understanding the material, not memorization. Understanding will be achieved through lecture, outside independent review/studying/practice problems, completing Sapling Homework, etc.

### **Required Materials:**

- *Exploring Chemical Analysis*, 5<sup>th</sup> Edition by Daniel C. Harris (hard copy suggested but e Text ok) ISBN: 1-4292-7503-0
- Sapling Exploring Chemical Analysis 6 months Access Card (purchase online at LUC bookstore or through Sapling directly, with or without the e Text, depending on if a hard copy is purchased)
- Inexpensive calculator for logarithmic (base 10 and base e), exponential, trigonometric functions OR a graphing calculator [which will be cleared of storage by Instructor on exam days]. Cell phones/tablet/laptops or any other electronic devices are NOT calculators and cannot be used as one at any time in the course. Only a 'traditional' calculator can be used for calculation work.
- Notebook paper or a notebook (note taking, sample problems, or in-class discussion problems).
- Sakai is used to post grades and other course material (syllabus, instructor information, discussion keys, etc.). Check Sakai often. If a student is unfamiliar with Sakai, talk to the Instructor ASAP. Instructor will show class the course Sakai site on the first day.

**Attendance Policy:**

It is expected students attend every scheduled lecture class and are *on time!* The schedule is on page 6. Summer school is expensive so get your money's worth! Make-ups exams are not given under any circumstances. Understanding the demands/schedule of summer school is a student's responsibility; do not be absent on days of exams. Discussion worksheets cannot be made up outside of class time; if a student is absent for a discussion worksheet, the student earns a zero and there are no exceptions to this rule. Students elect to take summer courses, which are optional, therefore a student's schedule should commit to the course's scheduled class time. Students are required to initial a sign-in sheet on each day of lecture, documenting and verifying their attendance. This sheet serves as a formal record. If an absence does occur, it is the absent student's responsibility to contact the Instructor promptly.

**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 a tablet device as these do not count as 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 is to 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 meant to be exhaustive but highlights several dishonest situations. Copying a student's discussion worksheet answers is another form of plagiarism/cheating. If it is determined that 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. Again, Sapling (online) Homework should be completed as an individual. Cases of suspect academic dishonesty will be handled according to University policy/guidelines. 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) Policy:**

Necessary accommodations will be made for students with disabilities who procure a SSWD letter. Do discuss your academic needs with the Instructor as soon as possible! To receive accommodations self-disclosure, proper documentation, and registration with the SSWD office 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 SSWD letter will be provided. SSWD Policies can be found here: <http://www.luc.edu/sswd/>

**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 12:30 pm; students who are late to class lose time, as extended exam time for late students is not granted, due to a lecture following exams. Students must take all exams on the assigned dates noted in the syllabus. **No make-up exams will be given under any circumstances** nor can a student request to take an exam early. The lowest exam grade out of the three one-hour exam grades will be dropped. If you are absent for one of the three one-hour exams, you receive a zero for that particular exam AND that is the exam grade that will be dropped. If you are absent again, for a second exam, you earn a zero and that zero is not dropped. Again, no make-up examinations are offered. The final exam is cumulative. No make-up exams are granted for the final exam under *any* circumstances! A student is not allowed to take the final exam early. If a student does not show up on the final exam day [Friday, July 1, 2016] to take the final exam, they receive a grade of zero for the final exam and that grade will not be dropped.

All exams are closed book, closed note unless otherwise specified. Graphing/scientific calculators *are* allowed. 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 signature verifies the student's attendance and completion of the exam. Exams will be graded as soon as possible. Students' exams and/or answer sheets will be 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 one week after the graded exam has been returned to the student. After one week 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 Tuesday, July 5<sup>th</sup>, 2016 and students can stop by to see their graded final exam on this date only. After July 5<sup>th</sup>, final exams are sealed and no longer can be viewed.

<b>Exam Dates:</b>	Wednesday, June 1, 2016	Exam #1, Chapt. 0-6 (one hour, 12:30 – 1:30 pm)
	Monday, June 13, 2016	Exam #2, Chapt. 7-11 (one hour, 12:30 – 1:30 pm)
	Friday, June 24, 2016	Exam #3, Chapt. 12,13,16,18-19 (one hour, 12:30 – 1:30 pm)
	Friday, July 1, 2016	Cumulative Final Exam (2 hours, 12:30 – 2:30 pm)

**Tutoring:** FREE Loyola University Tutoring Center tutors! To see the tutoring schedule and more information, visit the Tutoring Center webpage: [www.luc.edu/tutoring](http://www.luc.edu/tutoring). Chemistry is a fascinating, challenging subject. Summer courses are rigorous. A conscious, daily effort of studying must be made to master the principles taught in this course. Contact me if persistent troubles arise. Use office hours and the tutoring center to help clarify subject matter or other questions. Work on end of chapter problems in the textbook for practice/study!

### Sapling Learning (Online) Homework:

There are Sapling Learning (online) Homework problems assigned for each chapter covered. *These homework problems are required and are graded.* They are meant to help students practice the material [but by no means are the only 'practice' available, as there are problems at the end of the textbook]. Late homework submissions via Sapling will not be accepted; if homework is incomplete and the due date passes, the points earned are zero (0). Students cannot get credit for things that are not completed on time. Due dates are below and they are non-negotiable; I assigned due dates to keep students on track, completing the homework problems little by little over the course of the summer session.

Chapters	Due Date (by 11:55 pm / 23:55)
0,1	Monday, May 30 <sup>th</sup>
3,4,5	Friday, June 3 <sup>rd</sup>
6,8,9	Friday, June 10 <sup>th</sup>
10,11	Wednesday, June 15 <sup>th</sup>
7,12–14,16	Monday, June 27 <sup>th</sup>
18–23	Friday, July 1 <sup>st</sup>

The "Practice Assignment" in Sapling is 5 points extra credit. It opens May 23, 2016 at 3:10 pm (15:10) and closes May 30, 2016 at 11:55 pm (23:55). After close time, stated in the syllabus & Sapling, the extra credit is no longer available. If a student neglects to complete the extra credit within the above, defined period, that is the fault of the student and no extra credit points are awarded. No exceptions.

#### Directions to access Sapling Learning (online) Homework:

1. Go to [saplinglearning.com](http://saplinglearning.com) and click on "US Higher Ed" at the top right.
  2. If you already have a Sapling Learning account, log in and skip to step 3.
    - If you have a Facebook account, you can use it to quickly create a Sapling Learning account. Click "Create an Account", then "Create my account through Facebook". You will be prompted to log into Facebook if you aren't already. Choose a username and password, then click "Link Account". You can then skip to step 3.
    - Otherwise, click "Create an Account". Supply the requested information and click "Create My Account". Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
  3. Find your course in the list (you may need to expand the Analytical Chemistry subject header and term categories) and click the link for your course.
  4. If your course requires a key code, you will be prompted to enter it.
  5. If your course requires payment, select a payment option and following the instructions.
- eTEXTBOOK: Your course text is available as a low cost online eTextbook. You can search, highlight, take notes, and each homework question is linked back to the appropriate section in the eTextbook for immediate instructional help. You may purchase the eTextbook in step 5 on the homework payment screen.

Once registered and enrolled, log in to complete/review homework assignments. If you have technical problems or grading issues, email [support@saplinglearning.com](mailto:support@saplinglearning.com) explaining the issue. The Sapling Learning support team is usually faster and better able to resolve issues than your Instructor.

**In-class Discussions:**

During most of the lectures (~13), there will be a discussion period. Group work between students is encouraged through the proposing of several sample questions, each group working on answering 1-2 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 will be 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.

**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 pts in Sapling) because there is no extra credit when you go into the “real world.”

<b>Grading Category</b>	<b>Points</b>
Sapling (online) Homework	<b>106</b>
In-class Discussion problems	<b>39</b>
Exam #1 (one hour)	<b>125</b>
Exam #2 (one hour)	<b>125</b>
Exam #3 (one hour)*	<b>n/a</b>
Cumulative Final Exam (two hours)	<b>150</b>
Total	<b>545</b>

\*The lowest one-hour exam grade (out of Exams #1, 2, 3) will be dropped. i.e. the best two one-hour exam grades will count towards the final course grade in addition to the other grading categories listed.

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. No make-up exams are offered, ever.

Envision the following for lectures: class will promptly begin at 12:30 pm, starting with a ~50 minute lecture, followed by a 5 minute break, then a 30-40 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\*)

Date	Chapter	Lecture Topics
5/23	0, 1, 2	Chemical Analysis; Terms; Stoichiometry; Units; Conversions Review
5/25	3, 4	Math Tools; Sig Figs; Errors; Statistics
5/27	5, 6	Calibration Curve; Quality Assurance; Titrations
5/30	N/A	NO CLASS: MEMORIAL DAY!
6/1	6	<b>Exam #1</b> (Ch. 0,1,2,3,4,5,6 up to what covered on 5/27); Finish Titrations
6/3	8, 9	Acids & Bases; Buffers
6/6	9, 10	Buffers; Acid/Base Titrations
6/8	10, 11	Acid/Base Titrations; Polyprotic Acids and Bases
6/10	7	Gravimetric Analysis
6/13	13	<b>Exam #2</b> (Ch. 8,9,10,11,7); then Lecture EDTA Titrations
6/15	13, 16	EDTA Titrations contd.; Redox Titrations
6/17	16, 12	Redox Titrations; Chemical Equilibrium; Ionic Strength
6/20	14	Electrode Potential
6/22	18, 19	Light; Absorption; Beer's Law; Spectrophotometry; Instrumentation
6/24	20	<b>Exam #3</b> (Ch. 13,16,12,18,19); Atomic Spectroscopy; Instrumentation
6/27	21-22	Chromatography; Gas & Liquid Chromatography; Components GC or LC
6/29	22-23	Gas & Liquid Chromatography contd.; Ion Chromatography
7/1	N/A	<b>Cumulative Final Exam</b> ; Last Day of Class!

\*This is a guideline based on previous experience of my teaching of the course. The schedule can be subject to change at the Instructor's discretion based on the pace of the class. Six weeks will fly by and we have a lot of chemistry to cover!

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