

Chemistry 212-001, Quantitative Analysis Lecture

Fall 2015 Syllabus

Chem 212-001, Quantitative Analysis Lecture (3 credit hours), Tuesday and Thursday, 1:00–2:15 pm, Cuneo Hall Rm 109

Prerequisite: Chem 106 or Chem 102 & 112

Instructor: Dr. James DeFrancesco

Office: Flanner Hall 200A

Phone: (773) 508-3283

Office Hours: Tues/Th 11:30 am -12:45 pm, Tues 2:30 pm – 3:45 pm, and by appointment.

Email address: jdefrancesco@luc.edu

If an email is necessary, please write “Chem 212-001” in the subject line. I will generally answer emails within 24 hours.

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 fundamental techniques and current applications of chemical quantitative analysis used in biomedical, forensic, and environmental chemistry.

I encourage you to read the textbook before and after lecture. The major points will be discussed during lecture. The emphasis of this course is to understand the material and develop critical thinking skills. This will be achieved through lecture, outside independent review/studying/practice problems, and class participation through discussion.

Required Materials:

- *Exploring Chemical Analysis*, 5th Edition by Daniel C. Harris (hard copy suggested, but eText OK) ISBN: 1-4292-7503-0
- 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]. Always make sure calculator has batteries. Calculators *cannot* be shared. Cell phones are NOT calculators and cannot be used as one at any time in the course.
- Notebook paper or a notebook (note taking, sample problems, or in-class discussion problems).

Attendance Policy

It is expected students attend every scheduled lecture class on time. Students are allowed to attend only the section in which they are enrolled. Make-up exams will not be given.

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, are appropriate and encouraged.

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. 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. Cases of suspected 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

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! However, to receive any 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 and begin only once appropriate documentation has been received by the Instructor in a timely manner. Only those accommodations specifically listed in the formal SSWD letter will be provided. SSWD Policies and procedures can be found at: <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 begin promptly at 1:00 pm; late arrivals will not be granted extended exam time. Students must take all exams on the assigned dates noted in the syllabus. **No make-up exams will be given under any circumstances.** The lowest grade out of the four one-hour exam grades will be dropped (if you are absent for a one-hour exam, that will be the dropped exam). The final exam is cumulative. No make-ups will be granted for the final exam under *any* circumstances. If a student does not show-up to take the final exam, they will receive a grade of zero for the final exam and that grade cannot be dropped.

All exams are closed book and closed note unless otherwise specified. Graphing and scientific calculators *are* allowed. Calculators cannot be shared between students. The cover of the calculator must be removed and not be in plain view. A periodic table will be provided. Cell phones, tablets, smart watches, and computers do NOT count as calculators and cannot be used.

Exams *must be handed directly* to the Instructor after completion. The student will then show their Student ID or Driver's License to the Instructor and sign-in on an attendance form. This signature verifies the student's attendance and completion of the exam. Exams will be graded as soon as possible. Completed exams will be photocopied. Any discrepancies or questions about grading on hourly exams must be discussed with the Instructor no later than one week after the exam has been returned to the student. Grading changes will not be made on exams beyond the one week period. No exceptions.

Tutoring

The Tutoring Center at Loyola University offers free tutoring to students! Summer tutoring includes the following subjects: Biology, Chemistry, Math, Physics, and Statistics. To see the complete tutoring schedule and find additional information, visit the Tutoring Center webpage at www.luc.edu/tutoring.

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 to ask questions during lecture/discussion, office hours, etc. To further the atmosphere of respect, no recording devices will be permitted during lecture.

Chemistry is a fascinating subject and quite challenging. 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!

Discussion Sections

There are two sections assigned to this lecture. Each section meets once a week at the times and rooms listed below.

Section-002, Friday 12:35 – 1:25 pm, Cuneo Hall rm 116

Section-003, Friday 1:40 – 2:30 pm, Dumbach Hall rm 230

A discussion worksheet will be provided at the beginning of each period. I will demonstrate the first problem or a selected problem for the class. You will be expected to complete the worksheet problems by the end of the period (groups permitted). These will not be graded, however you will get full credit if you made a good faith attempt to complete the problem set. You must be present to get credit and this work cannot be made up outside of class time. The problem sets will be reviewed and returned the following week. This is the only mandatory homework I have planned for the course. I may add additional homework assignments throughout the course as needed.

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. Grades are not rounded.

Grading Category	Points
Discussion section problem sets	48
Four hourly exams (one will be dropped)	300
Cumulative Final Exam (two hours)	150
Total	498

Grading Scale

A	100–93.0%	C	72.9–69.0%
A-	92.9–89.0%	C-	68.9–66.0%
B+	88.9–85.0%	D+	65.9–63.0
B	84.9–81.0%	D	62.9–60.0
B-	80.9–77.0%	F	≤59.9%
C+	76.9–73.0%		

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

<u>Date, Day</u>	<u>Chapter</u>	<u>Lecture Topics</u>
Aug 25, T	-	Introduction
Aug 27, Th	0,1	The Analytical Process, Chemical Measurements
Sept 1, T	2,3	Tools of the Trade, Math Toolkit
Sept 3, Th	3	Math Toolkit, Statistics
Sept 8, T	4	Statistics
Sept 10, Th	5,6	Quality Assurance and Calibration Methods, Good Titrations
Sept 15, T	-	Exam 1 (ch 0-6)
Sept 17, Th	7,8	Gravimetric and Combustion Analysis, Introducing Acids and Basis
Sept 22, T	8	Introducing Acids and Basis
Sept 24, Th	9	Buffers
Sept 29, T	9	Buffers
Oct 1, Th	10	Acid-Base Titrations
Oct 6, T	-	No class (break)
Oct 8, Th	11	Polyprotic Acids and Bases
Oct 13, T	-	Exam 2 (ch 7-11)
Oct 15, Th	12	A Deeper Look at Chemical Equilibrium
Oct 20, T	13	EDTA Titrations
Oct 22, Th	14	Electrode Potentials
Oct 27, T	15	Electrode Measurements
Oct 29, Th	16	Redox Titrations
Nov 3, T	17	Instrumental Methods in Electrochemistry
Nov 5, Th	-	Exam 3 (ch 12-17)
Nov 10, T	18	Let There Be Light
Nov 12, Th	19,20	Spectrophotometry: Instruments and Applications, Atomic Spectroscopy
Nov 17, T	22	Gas and Liquid Chromatography
Nov 19, Th	23	Chromatographic Methods and Capillary Electrophoresis
Nov 24, T	-	Exam 4 (ch 18-20,22,23)
Nov 26, Th	-	No class (break)
Dec 1, T	21	Principles of Chromatography and Mass Spectrometry
Dec 3, Th	-	Review
Dec 8, T	-	Final Exam

*This schedule is a general guideline of what to expect during each course lecture. The schedule herein is subject to alteration at the discretion of the Instructor based on the pace of the course.

IDEA (Individual Development and Educational Assessment)

IDEA is the course/instructor evaluation system that Loyola University Chicago utilizes. *Essential* and *Important* objectives have been selected by the Instructor which represent the goals and development to be achieved throughout and as a result of completing the course. Near 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.

Essential objectives:

3. Learning to apply course material (improve thinking, problem solving, making decisions)
4. Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course
11. Learning to *analyze* and *critically evaluate* ideas, arguments, and points of view

Important objectives:

1. Gaining factual knowledge (terminology, classifications, methods, trends)