

# Syllabus for Chemistry 212: Quantitative Analyses - Spring Semester 2024

Quantitative Analysis ( Principles of Analytical Chemistry), 3 credit hours

Lecture: **TuTh 8:30-9:45am Flanner 007**

Discussion: **Wed 1:40-2:30 FH007**

Prerequisite: Chem 106 or 102 and 112 and recommend Chem 222 ,224 or 226 or permission of the instructor.

Instructor: Dr. Conrad Naleway,

Flanner Hall 200C, Phone 773-508-3115

E-mail: [cnalewa@luc.edu](mailto:cnalewa@luc.edu)

Office hours: In person - **Tuesday 10-11am** *Either in my office or if large group we can go up to lab 313*

and **Wednesday 5-6 pm** Zoom Site 495 082 9636

SI Leader: Claire Calhoun ([ccalhoun@luc.edu](mailto:ccalhoun@luc.edu))

Textbook: "Exploring Chemical Analysis" (4<sup>th</sup> or later edition), by Daniel C. Harris (textbook is a resource, exams based upon class coverage and discussion problems assigned)

Other Materials: You will need a laptop computer and a programable tablet (such as a iPad Pro/Surface) will be useful but not necessary to perform calculations using software programs EXCEL and MATHEMATICA, you will also need a calculator having logarithmic (base 10 and base e), exponential, and trigonometric functions. **Computer required**, iPad Pro or Equivalent tablet recommended but not necessary for class. iPad specifically useful for problem sets.

## Topics to be included:

1	Stoichiometry Review, Math Tools	6	Acid Base Titrations	11	Ionic Strength & Activity
2	Sampling Error	7	PolyProtonic Acid/Bases	12	Electrode Potential
3	Statistics & Quality Assurance	8	Gravimetric	13	Spectroscopy
4	Titrations & Acid/Base	9	Complexation (EDTA)	14	Atomic Absorption
5	Buffers	10	Redox Titrations	15	Chromatography & GC/MS

## Objectives

- 1) To teach fundamental aspects of acid/base chemistry, redox chemistry, electrochemistry, and ionic equilibria.
- 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.

Participation: Students will be given 3/5 points unless they show above average involvement in lectures and discussions. This is intended to motivate interaction and questioning during class, which is imperative to a productive upper-level class.

Discussions: Groups will work through problem sets and a single collective answer sheet will be submitted for grading.

**Exam Problems** will be largely variants of problems done in class or problems done in discussion period! Plus, there also may be a few conceptual questions on each Exam/Quiz. **There will be no make-up quizzes, or exams given unless extreme and documented circumstances might occur.**

Exams will be graded and returned as soon as possible, usually the next class period. ALL grading questions, points of clarification and grading errors must be brought to the instructor's attention during office hours **no later than one week after exam is returned**. There will be no exceptions to this rule! Each returned exam must be copied with original being returned to instructor with a handwritten note stapled to exam addressing concern(s).

**Tentative Exam Dates. 2/6, 2/29, 3/28, 4/18, final 5/4 (9am)**

All exams must be signed in the front, upper right-hand corner or will not be graded. This signature will be taken as a statement of honest and completely independent work. There will be no tolerance whatsoever for cheating or plagiarism. Simply, *any instance of dishonesty (including those detailed on the website provided below or in this syllabus) during exams will result in a failing grade for the course.*

**Final Grade** will be determined by:

Class Comparative Participation during Lecture (5%)

Discussion Group Problem Sets (15%)

Plus Exam Grade (80% total): Top 3 of 4 in class exams (20% each) plus final exam (20%)

**Note: Your Final Grade cannot be greater than the highest in class exam grade!!**

**Final Grading Scale:**

A 100-93;

A- 92-89;

B+ 88-85;

B 84-81;

B- 80-77;

C+ 76-73;

C 72-69;

C- 68-65;

D 64-55;

F<55

## Academic Integrity

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All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at:

<http://www.luc.edu/cas/advising/academicintegritystatement/>

A basic mission of a university is to search for and to communicate the truth as it is honestly perceived. A genuine learning community cannot exist unless this demanding standard is a fundamental tenet of the intellectual life of the community. Students of Loyola University Chicago are expected to know, to respect, and to practice this standard of personal honesty.

Academic dishonesty can take several forms, including, but not limited to cheating, plagiarism, copying another student's work, and submitting false documents.

Any instance of dishonesty (including those detailed on the website provided above or in this syllabus) will be reported to The Chair of The Department of Chemistry & Biochemistry who will decide what the next steps may be. Instances of academic dishonesty will warrant **immediate failure of the course plus referral to the Dean's office.**

## Supplemental Instruction (SI) Claire Calhoun

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There will be a Supplemental Instruction (SI) study sessions available for this course. An SI leader, is a student that has recently excelled in the course, leads SI sessions. Session attendance is open to all and is voluntary, but extremely beneficial for those who attend weekly. Times and locations for the SI session can be found here: [www.luc.edu/tutoring](http://www.luc.edu/tutoring). Students who attend these interactive sessions find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Research shows students whom regularly attend sessions have higher grades at the end-of-the-semester and more deeply understand course concepts than those who do not. Students are asked to arrive with their Loyola ID, lecture notes, and textbook.

Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation (develop standard form on web) describing the reason for and date of the absence. This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time. (<https://www.luc.edu/athleteadvising/attendance.shtml>)

## Final Exam:

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The University sets the schedule for all final exams. The final will be held on **May 4<sup>th</sup> at 9am**. There will be no make-up final exams given without permission by the Dean's Office. Instructors may not reschedule final exams for a class for another day and/or time during the final exam period. There can be no divergence from the posted schedule of dates for final exams. Individual students who have four (4) final examinations scheduled for the same date may request to have one of those exams rescheduled. If a student reports having four final examinations scheduled for the same date, students should be directed to e-mail a petition to Adam Patricoski, Assistant Dean for Student Academic Affairs, CAS Dean's Office ([apatricoski@luc.edu](mailto:apatricoski@luc.edu)).

All students who have multiple final examinations scheduled for the same date may request to have one of those exams rescheduled. If a student reports such, students should be directed to email a petition to Lester Manzano, Assistant Dean for Student Academic Affairs, CAS Dean's Office ([lmanzan@luc.edu](mailto:lmanzan@luc.edu)).

## Face Mask Policy:

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In this class face mask policy will be largely optional, UNLESS there is a substantial change in spread of infectious disease in the community. If so, we will discuss potential change in policy to protect all of us.

## PASS/FAIL Conversion Deadlines and Audit Policy :

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A student may request to convert a course into or out of the "Pass/No-Pass" or "Audit" status only within the first two weeks of the semester. For the Spring 2023 semester, students are able to convert a class to "Pass/No-Pass" or "Audit" first two weeks of class. . Students must submit a request for Pass/No-Pass or Audit to their Academic Advisor.

## Course Repeat Rule

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Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W).

After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry & Biochemistry website: <http://www.luc.edu/chemistry/forms/> and personally meet and obtain a signature from either 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.

## Accommodations for Religious Reasons

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If you have observances of religious holidays that will cause you to miss class or otherwise effect your performance in the class you must alert the instructor **within 10 calendar days of the first class meeting of the semester** to request special accommodations, which will be handled on a case by case basis

## Student Accommodations

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The Student Accessibility Center (formerly known as Services for Students with Disabilities), Sullivan Center (773-508-3700), <http://www.luc.edu/sac>, has the mission “to support, service, and empower Loyola University Chicago students with disabilities” and to “Partner with faculty and staff to provide opportunities for collaboration, professional development, personal growth, and staff interaction, as they relate to students with disabilities.” Please direct all questions concerning accommodations of disabilities to the Student Accessibility Center. Academic accommodations afforded to students require documentation and review. The Student Accessibility Center will issue accommodation letters for registered students to present to their instructors: accommodations are not active until students present these letters to their instructors. If students’ accommodations involve attendance or deadlines, instructors and students will jointly complete and execute an Agreement Form articulating their terms. See <https://www.luc.edu/sac/faculty/facilitatingaccommodations/> for guidance about implementing various kinds of accommodations in a way that is appropriate to your class. The Student Accessibility Center stands ready to work with you.

## Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):

Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and to receive notes or other written information distributed in the missed classes.

Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation (develop standard form on web) describing the reason for and date of the absence.

This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time.

<https://www.luc.edu/athletheadvising/attendance.shtml>

## Privacy Statement

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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. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.