

# CHM3120, Introduction to Analytical Chemistry

Fall 2024

## COURSE INFORMATION

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<b>Instructor:</b>	Dr. Yong Zeng, Colonel Allen R. and Margaret G. Crow Term Professor
<b>Office:</b>	LEI114
<b>Email:</b>	<a href="mailto:zengy@chem.ufl.edu">zengy@chem.ufl.edu</a>
<b>Class Meetings:</b>	FLG245; Tuesday, Periods 2 & 3 (8:30–10:25 a.m.); Thursday, Period 3 (9:35-10:25 a.m.),
<b>Course website:</b>	E-learning (Canvas)
<b>Teaching assistant:</b>	Cong Sun, <a href="mailto:sun.cong@ufl.edu">sun.cong@ufl.edu</a>
<b>Office Hours:</b>	Tuesdays, 1:00 to 2:30 PM (tentative).
<b>Textbook:</b>	"Quantitative Chemical Analysis", either the 9th Edition (Daniel C. Harris, 2016) or the 10th Edition (Daniel C. Harris, Charles A. Lucy, 2020)

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## OBJECTIVES

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The ability to quantitatively measure chemicals and molecules is a part of the skills required for numerous disciplines and careers including medicine, pharmacology, ecology, biology, and atmospheric and environmental sciences. The goal of this course is to introduce you to the major principles of analytical chemistry with emphasis on the fundamental methods used for chemical analysis. The focus is on three important aspects: how to design experiments, how to analyze data, and how the tools of measurement work. The objectives of the course are

1. Learn how to apply the *analytical approach* to answer scientific questions.
2. Learn how to evaluate confidence through statistical and error analysis methods.
3. Understand the principles and use of the instruments of chemical analysis.

## EVALUATION

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**Exams.** There will be three in-semester exams and a cumulative final exam. Only the top three exam grades will be counted towards your final grade, so the lowest of the four exam scores is dropped. Each exam weighs equally (33.33%). **No make-up exam** will be given. Note that you have one chance of missing an exam due to whatever reason. Reserve these opportunities for an illness or other serious matters.

**Grading scale.** All grade calculations will be done on a percentage basis. The final grade will be a weighted average of all components. The letter grades will be assigned according to the following scale:

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.9	A-	3.67
84.0 - 86.9	B+	3.33
81.0 - 83.9	B	3.00
78.0 - 80.9	B-	2.67
75.0 - 77.9	C+	2.33
72.0 - 74.9	C	2.00
69.0 - 71.9	C-	1.67
66.0 - 68.9	D+	1.33
63.0 - 65.9	D	1.00
60.0 - 62.9	D-	0.67
0 - 59.9	F	0.00

UF grading policy can be viewed at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

**Disputing a score.** If you have any concern about your score, please contact the instructor or the TA within three days after posting to dispute a score. We do our best to ensure that our grading is fair for all students. After that, all scores are final. Re-takes of exams are not offered.

## COURSE POLICIES

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**Attendance.** Attendance will not be recorded. Additional materials are often presented to help students' learning. PowerPoint lectures will be available on Canvas, but may not contain all the information discussed in class. Lectures will NOT be recorded. Therefore, attendance at lectures is important for assimilating the course material. Please silence cell phones before coming into the class.

**Recording of lectures:** Course materials prepared by the instructor, together with the content of all lectures and review sessions presented by the instructor, are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor are prohibited. Upon request, the instructor will usually grant permission for students to make audio recordings of lectures, on the condition that such recordings are only used as a study aid by the individual student making the recording. Unless explicit permission is obtained from the instructor, such recordings may not be modified and must not be transferred or transmitted to any other person, whether or not that person is enrolled in the course.

**University Honesty Policy:** UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel.

For academic misconduct in this course, *at the very minimum, you will receive a grade of zero on any work in which you violate these integrity standards and all violations will be reported to the appropriate University officials.* The instructor reserves the right to retain copies of all submitted work.

### Other Information

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://disability.ufl.edu/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

For counseling the following resources are available to students: **U Matter, We Care:** If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) or 352-392- 1575. **Counseling and Wellness Center:** <https://counseling.ufl.edu/>, 352-392-1575; the University Police Department: 352-392-1111 or 911 for emergencies. **Sexual Assault Recovery Services (SARS):** Student Health Care Center, 352-392-1161.

## TENTATIVE COURSE SCHEDULE

<b>Weeks</b>	<b>Topics</b>	<b>Book Chapters</b>
Aug. 22	Introduction	Chap. 0, 1
Aug. 26-30	Analytical Measurements	Chap. 1, 2, 3
Sept. 2-6	Errors/Statistics	Chap. 3, 4
Sept. 9-13	Statistics/Calibrations	Chap. 4, 5
Sept. 16-20	Calibrations/Sampling	Chap. 5, 28
<b>Sept. 24</b>	<b>Exam 1</b>	<b>Chaps. 0-5, 28</b>
Sept. 26	Equilibrium/Titrations	Chaps. 6
Oct. 1-3	Acid Base Equilibria	Chap. 8, 9
Oct. 7-11	Acid Base Equilibria	Chap. 10, 11
Oct. 14-18	Spectrophotometry	Chap. 18, 19
<b>Oct. 22</b>	<b>Exam 2</b>	<b>Chaps. 6, 8-11</b>
Oct. 24	Spectrophotometers	Chap. 19, 20
Oct. 28-31	Chromatography/GC	Chap. 23, 24
Nov. 4-8	HPLC/HPLC-MS	Chap. 25, 22
<b>Nov. 12</b>	<b>Exam 3</b>	<b>Chaps. 18-20, 22-25</b>
Nov. 14	Capillary and other separation methods	Chaps. 26
Nov. 18-22	Electrochemistry/Potentiometry	Chap. 14, 15
<b>Nov 25-29</b>	<b>Thanksgiving break (no class)</b>	
Dec. 3	Electroanalytical Methods	Chap. 17
<b>Dec. 9</b>	<b>Final Exam (3:00 pm - 5:00 pm)</b>	<b>Comprehensive</b>