

Instructor – Dr. Charles R. Martin, University Distinguished Professor of Chemistry
Call me **The Colonel** (Honorable Order of Kentucky Colonels), crmartin@ufl.edu

Canvas - We will use the UF Canvas e-Learning system for course management. You access e-Learning through your myUFL portal. Please review carefully the Canvas page for this course. In particular, look over the files that I have uploaded and any “Announcements” I have made. All of the information in this syllabus is at Canvas, and a lot more.

Class Meeting Times – Tuesday, Period 3 (9:35-10:25), Thursday Periods 2 & 3 (8:30–10:25) in CLB 130.

Instructor’s Office Hours –Tuesdays 4:00 to 5:00 PM, online through Zoom.

TA – To be announced (TBA)

TA's office hours – TBA

Course Information and Objective – Analytical Chemistry entails measuring the concentration of a substance (*e.g.*, a drug, DNA, pollutant, protein) in a solution (blood, water, saliva, air, *etc.*). Knowing the concentration is important because, for example, if the concentration of a pollutant in water is too high, the water is unsafe to drink. Alternatively, if the concentration of a drug in the blood is too low, it will not have the desired therapeutic effect. Analytical Chemistry is part of many disciplines and careers including medicine, pharmacology, ecology, biology, and atmospheric and environmental sciences.

Analytical Chemistry has been my life's work. For you to understand it, I must first give you background information on the concept of chemical measurements, how chemical measurements are made, and what tools and mathematics are used. With this foundation in place, we will move on to the methods of chemical analysis with emphasis on electrochemical, spectrophotometric and fluorometric methods. My objective is to teach in a way that you will truly understand and appreciate this interesting and important branch of chemistry.

Text - “Quantitative Chemical Analysis”, either the 9th Edition (Daniel C. Harris, 2016) or the 10th Edition (Daniel C. Harris, Charles A. Lucy, 2020) may be used.

Chapters Covered – Chapters 6, 7, 9, 10, and 11 of your text cover material that you were taught in freshman chemistry. I do not intend to teach this material to you again. However, material from these chapters will be discussed as needed and could appear on an exam. I advise you to read these review chapters.

The bulk of my lectures will be on material from the chapters listed below. As noted in this list, for some chapters, not all of the sections in the chapters will be covered. Important point – I often do not present the material in the same order as the book. For example, in my lectures, materials in Chapters 14 and 15 are combined and presented in a different order. It is therefore essential that you come to the lectures.

Chap 0, “The Analytical Process” - Entire chapter is covered

Chap 1, “Chemical Measurements” - Entire chapter is covered

Chap 2, “Tools of the Trade” - Sections 2-9, 2-10 and 2-11 are not covered

Chap 3, “Experimental Error” - Entire chapter is covered

Chap 4, “Statistics” - Entire chapter is covered

Chap 5, "Quality Assurance and Calibration Methods" - Entire chapter is covered
Chap 8, "Activity" - Sections 8-4 and 8-5 are not covered
Chap 14, "Fundamentals of Electrochemistry" - Entire chapter is covered
Chap 15, "Electrode and Potentiometry" - Sections 15-7 and 15-8 are not covered
Chap 17, "Electroanalytical Techniques" - Sections 17-5 and 17-6 are not covered
Chap 18, "Fundamentals of Spectrophotometry" - Entire chapter is covered
Chap 19, "Applications of Spectrophotometry" – Only Sections 19-1 and 19-5 are covered
Chap 20, "Spectrophotometers" - Sections 20-4 and 20-5 are not covered

Exams - There will be three during-semester exams and a final exam.

During-semester exams

Exam 1	Thursday, September 23, Periods 2 and 3 (8:30 AM - 10:25 AM)
Exam 2	Thursday, October 21, Periods 2 and 3 (8:30 AM - 10:25 AM)
Exam 3	Thursday, December 2, Periods 2 and 3 (8:30 AM - 10:25 AM)
Final Exam	Monday, December 13, 10:00 AM - Noon

Grading –All four of the exams are worth 200 points each. You have two options.

Option 1 - Drop one during-semester exam and take the final, in which case

Sum of 2 best during-semester exam scores	400 points max
Final exam score	<u>200 points max</u>
Total maximum earnable points 600	

Option 2 - Keep all during-semester exams and skip the final, in which case

Sum of 3 during-semester exam scores	600 points max
Total maximum earnable points 600	

Because one of the during-semester exams can be dropped, no make-up exams will be offered.

This means if you miss one of the during-semester exams, you default to Option 1.

However, if you have a sanctioned absence (*e.g.*, religious observance, sanctioned university event) you will be allowed to take an exam before, not after, the rest of the class. You must inform your TA and me at least two weeks in advance of a sanctioned absence.

Letter Grade Cutoffs, Percent of maximum (600) points

A 100 to 90 %, A- 89 to 86 %, B+ 85 to 83 %, B 82 to 79 %, B- 78 to 76%, C+ 75 to 73%
C 72 to 69 %, C- 68 to 66 %, D+ 65 to 63%, D 62 to 57 %, D- 56 to 50 %, F 49 to 0%

Reporting Exam Scores to You – Our goal is to get the exam scores to you as soon as possible after the exam. But to be more concrete, we anticipate that the latest date we would get scores back to you would be the Tuesday following the Thursday exam.

Disputing a Score – To dispute a score send an e-mail message to your TA and me. You have 48 hours after posting to dispute a score. After that, all scores are final.

Chapters Covered for Each Exam – See above for specific sections of each chapter covered. This schedule is tentative and may be revised as the semester progresses. Important point – The specific material to be covered in an exam will be announced before the exam.

Exam 1 – Chaps 0 through 4 (maybe some of Chap 5)

Exam 2 - Chaps 5, 8, 14, 15, and 17

Exam 3 – Chaps 15, 18, 19, and 20

Homework Problems - These problems are from the 9th Edition of “Quantitative Chemical Analysis,” (Daniel C. Harris). For those who do not have the 9th Edition, click the “Files” link at the Canvas page, and you will find a folder called “Homework Problems.” PDF files for the problems from each chapter (9th Edition) can be found in this file. At the “Files” link you will also find a folder called “Solutions to Homework Problems.” Here you will find detailed solutions to the homework problems.

Chap 0 - 1, 2, 3, 4, 6

Chap 1 - 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 16, 18, 19, 20, 21, 22, 25, 26, 27, 29, 30, 31, 32, 33, 34, 35, 36

Chap 2 - 1, 6, 17, 18, 19, 23 (a,c), 24, 30

Chap 3 - 1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 15, 16, 21

Chap 4 - 1, 2, 3, 4, 5 (a,b), 9, 10, 12, 13, 15, 21, 26, 27, 36, 37 (a,b,c)

Chap 5 - 3, 4, 5, 7, 8, 12 (part 1), 16, 18, 19, 23, 24, 30, 31

Chap 8 - 1, 2, 3, 4, 5 (a,b,c), 7(a), 10, 13

Chap 14 - 1, 2, 3, 5, 6 (a), 7, 8, 10, 12, 14, 16, 17 (a,b,c), 19 (a,b), 21, 23, 28, 29, 32, 34 (a), 42

Chap 15 - 1, 2 (a,b), 3, 5, 6, 7, 10, 12, 13, 14, 17, 19, 21, 25, 27 (a), 31, 32, 37, 39, 42

Chap 17 - 1, 9 (a), 6, 8, 2, 3, 15, 16, 18, 19, 22, 25, 26 (a,b,e)

Chap 18 - 1, 2, 3, 4, 7, 8, 9, 11, 12, 13, 14, 15, 18 (a), 19, 20, 23, 31, 32, 33, 35, 36

Chap 19 - 3, 5, 20

Chap 20 - 1, 2, 3, 4, 5, 6, 12, 14

UF Grading Policies - See <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Academic Honesty - I believe that honesty is one of the most important of human virtues. Being honest keeps you out of trouble, and honesty provides the best path forward in any situation. Exams are given under the provisions of the University of Florida Honor Code. Any student caught cheating will receive a failing grade in the course. Review the Honor Code here. <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

Other Information

Students wanting disability accommodations, please contact the Disability Resource Center at www.dso.ufl.edu/drc/ or call 352-392-8565.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations. Students will be notified when evaluations are required.