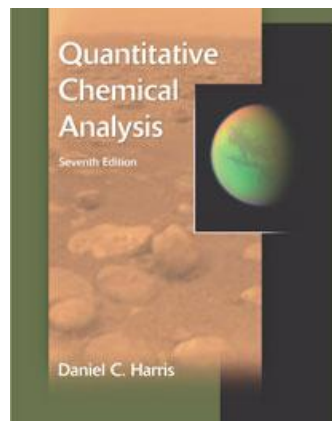


Quantitative Analysis (Analytical Chemistry)

Spring 2011

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Office Hours: MWF 11:00-12:00
Thurs. 1:00-2:00 pm.
And other times by appointment



Text: Daniel C. Harris, *Quantitative Chemical Analysis*, 7th ed.

Chemical analysis has become a part of everyday life in America -- rarely a day passes without an environmental, biochemical or toxicological problem that is defined in terms of chemical composition and measurement. EPA standards, chlorofluorocarbon measurements in the stratosphere, neurological tracers, nuclear cleanup sites -- all of these politically potent subjects require the use of chemical analysis to help define the issues. In this course we will learn how to apply the concepts of chemical reactivity and equilibrium from General Chemistry in a quantitative fashion to the field of chemical analysis. Through a combination of lectures, laboratories, and problems we will learn how to design and implement a well-defined chemical analysis that conveys the results with full scientific validity.

Course Topics Outline:

Week Chapters & Topics

1	Ch. 0	The Analytical Process
	Ch. 1	Measurements
	Ch. 2	Tools of the Trade
2	Ch. 3	Experimental Error
	Ch. 4	Statistics

Week Chapters & Topics

3 Ch. 6 Chemical Equilibrium

4 Ch. 7 Titration

Examination I

5 Ch. 8 Activity
Ch. 8 Systematic Equilibrium

6 Ch.9 Monoprotic Acid-Base Equilibrium
Ch. 10 Polyprotic Acid-Base Equilibrium

7 Ch. 11 Acid-Base Titration

Examination II

8 Ch. 12 Complexometric Titration

9 Ch. 14 Fundamentals of Electrochemistry

10 Ch. 14 Fundamentals of Electrochemistry (cont.)

11 Ch. 15 Electrodes and Potentiometry

Examination III

12 Ch. 16 Redox Titrations

13 Ch. 17 Electroanalytical Techniques

14 Ch. 17 Electroanalytical Techniques (Continued)

15 *Final Examination*

Grading: Homework problems will help you prepare from the exam, but exam questions will, in most cases, *be more involved than the homework*. It is therefore important that you UNDERSTAND what you are doing and that you do not just memorize various problem types.

1. **Lecture:** The lecture portion of the course comprises 65% of the total grade and will be determined as follows:
 - a. Three exams (two midterms each worth 100 points) and a final worth 150 points
 - b. Weekly quizzes and or problem exercises (see below) each worth 10 points. The lowest quiz grade will be dropped.

The actual grade will be based on the grading scale given below:

A 90% B 80% C 70% D 60%

Academic Integrity: It is your responsibility to maintain a high degree of integrity in your work. Cheating of any kind will not be tolerated and will result in a failure in the course! The following are considered cheating: (a) Sharing of results and answers on lab reports, graded assignments, quizzes and exams; (b) Use of unauthorized materials during an exam; (c) Plagiarism, including copying a fellow student's lab report or homework.. When in doubt, both parties involved in plagiarism (both the copier and the copyee) will be held responsible for the integrity violation. Please refer to the school's official Academic Integrity Policy for further information.

2. **Laboratory:** The laboratory portion of the course is worth 35% of the total course grade. *Note: In order to receive a passing grade for Analytical Chemistry you **MUST** pass both the lecture and laboratory portions of the course!*
Your grade is based on your written lab reports as well as your performance in the laboratory (techniques and accuracy).
3. **Weekly Problem Assignments:** Weekly problem assignments will be given out at the beginning of each week of class. I will provide answers once the assignments are graded.