

CHEM 222: Quantitative Analysis
Spring 2016

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Classes: Tuesday & Thursday 10:20-11:30am, Hall of Science 206

Labs: Wednesday, 1:15-4:15pm, Superlab (Hall of Science 205)

Problem sessions: Friday, 11:45am-12:35pm, Hall of Science 206

Office hours: M: 10:30-11:30 am

T: 9:00-10:00 am

W: 10:00-11:00 am

Th: 1:30-2:30pm

Please email me to set-up a meeting at another time.

Required textbook: Daniel C. Harris, "Quantitative Chemical Analysis," 8th edition (2010).

Course objectives:

By the end of this course, students should be able to:

- Carry out an analysis with precision and accuracy
- Use equilibrium calculations to describe the chemical composition of a solution
- Predict the influence of experimental parameters on measured concentrations
- Recognize and evaluate assumptions made in calculations
- Describe the major techniques of quantitative analysis

Course Content:

| Subject | Chapter in text*‡ |
|--|--------------------------|
| Concentration | 1 |
| Solubility and precipitation equilibria | 6 |
| Activity | 7 |
| Systematic treatment of equilibrium | 7 |
| Acid-base equilibria (monoprotic, diprotic, buffers, titrations) | 8, 9, 10 |
| Solving complicated systems of equilibria | 12 |
| Complexation equilibria | 11 |
| Redox equilibria | 13, 14 |

*We will not cover all portions of all chapters. Outside material will also be included.

‡ Note that a working knowledge of the statistical methods covered in Chapter 4 is assumed for lab (obtained from Research Methods).

Assessment (total: 500 points)

2 midterm tests, in class – **50 points each**

midterm 1: Thursday, February 25

midterm 2: Thursday, April 7

You may bring one page (one side) of handwritten notes and a calculator to each test.

Homework – **50 points**

~every week; due Tuesdays at the **beginning** of class

Quizzes – **50 points**

First 10 minutes of Thursday classes. Please bring your calculator. The lowest quiz grade will be dropped.

Final exam – **75 points**

8:00 am, Friday May 6

Cumulative, with emphasis on the last portion of the course.

You may bring one page (both sides) of handwritten notes and a calculator to the exam.

Labs – **225 points**

Due at the **beginning** of lab one week after completion of in-lab component (see lab manual for details)

Grade guidelines:

A- to A+: 90s; B- to B+: 80s; C- to C+: 70s; D- to D+: 60s; F: <60%

Note: You must obtain at least 50% in each of the class and lab components of this course to earn a passing grade.

Policy on late lab reports and class assignments

- Homework will be accepted **up to one day late**, with the loss of 10% of grade. Late labs will be accepted with the loss of 10% per day, including weekends. Late penalties start when class/lab begins.
- You may have one day grace for each of one assignment and one lab during the semester.

Policy on attendance

Class attendance and active participation will be considered when determining whether to elevate borderline grades (e.g. from B- to B etc.). Attendance at all lab sessions is mandatory, and you cannot pass the course if you have not completed all labs. Labs that must be made up due to unavoidable documented absences should be rescheduled promptly in consultation with Dr. Holliday.

As homework is handed in and quizzes take place at the start of the class period, on-time arrival will improve your grade. If you have an unavoidable absence (due to an extenuating circumstance that is documented by an academic dean or health professional), please notify the course instructor as soon as possible. You are responsible for providing documentation and

making arrangements in a timely manner or else a grade of zero will be assigned for missed work.

Policy on academic honesty

Please be familiar with the [college policy on academic honesty](#) that applies to this course. You may discuss assignments and labs with others, but copying answers is not acceptable and will be penalized.

Accommodations Statement

Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located on the lower level of Monocacy Hall, or by calling 610-861-1401. You are also welcome to contact me privately to discuss your academic needs; however, accommodations cannot be provided until authorization is received from the Academic Support Center.