

Instrumental Methods of Chemical Analysis

Syllabus

Course Number SC/CHEM 3080 4.0 Section M
Term W
Session 2013-2014
Prerequisites SC/CHEM 2080 4.0; SC/PHYS 1010 6.0 or SC/PHYS 1410 6.0,
or permission from the course director

Course Director Derek A. Jackson
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Lab Coordinator Carolyn Hempstead
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Meeting times Section A
Lectures T,R 10:00 90 min CB 121
Office hours: TBD

Laboratory 3 hour sessions at variable times during the week, depending on lab group, in CB 343. All laboratory concerns and conflicts go through Carolyn.

The labs will start on the week of January 20, 2014 with lab manuals being available as of January 16.

Note: The laboratory portion of the course represents a significant fraction of your final grade. To complete the experiments and reports satisfactorily, you must read and understand the experiment in the manual and the background information in the textbook before coming to the lab. It is probable you will be performing an instrumental technique that has not been covered in lecture yet. You must also be comfortable with proper analytical techniques and performing linear regressions manually (as learned in CHEM 2080).

Learning Tools Textbook:
Principles of Instrumental Analysis 6th Edition by Skoog, Holler and Crouch.

This textbook is available at the York bookstore and is a **recommended** text. Most analytical chemistry textbooks include sections on instrumentation and can be readily substituted. We will not be comprehensively covering the Skoog textbook and you will **not** be responsible for material not covered in class.

Evaluation The grade for this course will be assessed on the following basis:

Midterm (20%)	February 25, 2014 (in class)
Problem sets (2 x 7.5%)	Before and after midterm
Laboratory (30%)	Throughout the term
Final exam (35%)	Date set by registrar's office

NOTE: All students are expected to be available for the complete final exam period. Conflict with previously made travel arrangements is not an acceptable reason for missed exams.

Missed Midterm If you miss the midterm due to a legitimate illness, please provide an attending physician statement to D. Jackson within 48 hours (you do not need to fill out any other petition documents). For other extenuating circumstances please contact D. Jackson directly. The course evaluation scheme will change for those people to the following:

Midterm (0%)
Problem sets (2 x 10%)
Laboratory (30%)
Final exam (50%)

Final grade Faculty of Science approved letter grades

NOTE: Numerical grades are only guides for assigning of final grades. The course director retains the prerogative on how to use numerical grades to assign letter grades. Exam and laboratory marks are made available to students, however a final numerical mark is not disclosed to the student.

Course Content The course will cover a variety of topics pertaining to instrumental chemical analysis. The exact material covered may vary slightly throughout the term but will include:

Introduction to Instruments

Calibration Methods (External, Standard Addition, Internal Standards)

Analytical Spectroscopy

- Optical Instrumentation
- Atomic Absorption
- Atomic Emission
- Molecular Spectroscopy (UV-Vis)
- Luminescence Spectroscopy
- FT-IR

Analytical Separations

- Separation Theory
- Gas Chromatography

- Liquid Chromatography
- Ion Chromatography

Mass Spectrometry

- ICP-MS
- GC-MS
- LC-MS/MS

Electroanalytical Chemistry

Nuclear Magnetic Resonance (if time permits)