

Chemistry 7600
Analytical Spectroscopy
Spring 2007

Course Name: Analytical Spectroscopy

Time/Location: TBA

Instructor: Stephen Bialkowski *Office* ML-359 *Phone:* 797-1907

Office Hours: by appointment using electronic mail Stephen.Bialkowski@usu.edu

Text: *Spectrochemical Analysis*, James D., Jr. Ingle and Stanley R. Crouch, Prentice Hall (1988)
ISBN: 0138268762 and SAS Focal Point CD-ROM

Course Content: The purpose of this course is to survey many of the methods of spectrochemical analysis used in the analytical laboratory. The lectures will be a mixture of practical, theoretical, and instrumental topics. Reading the book is an essential component of the class. There will be time to go into detail on certain subjects.

Course Objectives: This is a graduate-level course addresses various aspects of spectroscopic chemical analysis. The student will learn the relative merits of the techniques, the operating principles, and develop problem solving skills generally useful in chemical analysis. Instrumental concepts, spectroscopic data collection and analysis, and software, as applied to problem solving using analytical spectroscopy, will be discussed. The focus is on quantitative analytical spectroscopy. However, the basic spectroscopic information as it relates to physical structure will also be addressed.

Lectures: Topics listed in the book by Ingle and Crouch and current topics in APPLIED SPECTROSCOPY will be discussed.

Examinations: Three to five assignments will be given. These assignments are to be returned within a week for grading. Your grade will be based on performance on these assignments and the final report.

Homework: Reading exercises from textbooks and other outside sources will be assigned. Students are expected to find, read, and interpret articles found in the scientific literature. Students will also learn how to use "the net" to research topics.

Grading: Your grade will be based on homework assignments (70%) and a final report describing the operation of a particular technique reported on in APPLIED SPECTROSCOPY (30%). Your report will add thought to the original paper and describe the details left out of the paper. The report to be turned in on the day of the final will consist of an APPLIED SPECTROSCOPY article printed since 1997 and a five to ten page narrative which describes the technique in full detail.

Withdrawal Policy: This course will follow the University policy on withdrawals stated in the current Undergraduate Catalog. Drop dates are listed in the Schedule of Classes.

Missed Examination Policy: Students may be excused from examination in cases of emergency.

Attendance Policy: Attendance is required for satisfactory performance.

Student Disability Statement: Any student with a disability that requires accommodations must contact the Instructor. The disability must be documented by the Disability Resource Center. Course materials may be requested in alternative formats.

Material: A tentative schedule is given below. Dates are only approximate.

Topic	Approximate Dates	Reading
Introduction	January 9	Chapter 1
Measurements	January 16	Chapter 2
Optical Components	January 23	Chapter 3
Spectrometer Physics	January 30	Chapter 4
Signals and Noise	February 6	Chapter 5
Methodology	February 13	Chapter 6
Atomic Spectrometry	February 20	Chapter 7
Atomic Emission	February 27	Chapter 8
Atomic Absorption	March 5	Chapter 10 & 11
Molecular Spectra	March 19	Chapter 12
UV/VIS Absorption	March 26	Chapter 13
Infrared	April 2	Chapter 14
Emission	April 9	Chapter 15
Scattering	April 16	Chapter 16
Recent Methods	April 23	Chapter 17