Chemistry 327: Fundamentals of Analytical Science

Fall 2015

Lecturer:	Professor Lloyd Smith
E-mail:	smith@chem.wisc.edu
Office:	Chemistry 4209
Office hours:	after class or by appointment
Web Site:	https://learnuw.wisc.edu/

Course Credit:	4 credit hours
Lecture:	TR 8:50-9:40 a.m. in B371 Chemistry
Discussion:	W 7:45-8:35 a.m.
Lab:	TR 1:20-4:20

Chemistry 327 is an intermediate level analytical chemistry course for non-majors. It emphasizes the fundamentals of chemical measurement in chemistry, biology, engineering, geology, and the medical sciences. Topics include equilibria of complex systems, spectroscopy, electrochemistry, separations, and quantitative laboratory technique.

Textbook: *Quantitative Chemical Analysis*, Ninth Edition, by Daniel C. Harris, W.H. Freeman and Company, 2016.

Lab Manual: *Laboratory Manual for Analytical Chemistry - Fall 2015*, Department of Chemistry, UW-Madison. Lab manuals will be sold by Alpha Chi Sigma in the lobby of the chemistry building (corner of Mills Street and University Avenue) beginning September 2.

Lab Notebook: Carbonless laboratory notebook with numbered, duplicate pages.

Calculator: A scientific or graphing calculator is required. Only calculators that are permitted on SAT or ACT tests may be used on exams. You may NOT use any stored information, programs, or applications on exams unless given explicit permission.

Safety Goggles: Industrial quality eye protection is required at all times when you are in the lab. Safety goggles that completely seal around the eyes and fit over regular glasses can either be purchased from local bookstores or from Alpha Chi Sigma in the chemistry building's Mills Street lobby.

USB Drive: A USB flash drive that will hold at least 2 GB is required for laboratory.

Course Web Site: Assignments, announcements, lecture notes, handouts and homework will be posted on the course web site.

Problem Sets: Regular problem sets will be assigned on Tuesdays and will be due the following Tuesday (hand in to your TA in lab).

Exams: There will be three exams, each counting equally towards the final grade. The first two exams will be conducted during the scheduled laboratory period, and the third will be given during the regularly scheduled final exam time. The exams will not be cumulative, but will nonetheless draw upon knowledge gained during previous parts of the course.

Exam I: Tuesday October 6, 3:00-4:30 PM (301, 302, 303--Chemistry B371; 304, 305—Birge Hall B302)
Exam II: Tuesday November 10, 3:00-4:30 PM (301, 302, 303--Chemistry B371; 304, 305—Birge Hall B302)
Exam III: Tuesday December 22 (12:25-2:25 PM) (Final exam room – to be announced)

No make-up exams will be given. Students with scheduled classes which conflict with the exams may arrange to take an early exam. Exams will be problem oriented and will test your understanding of both lecture and laboratory material.

Grading: The weighting of the various parts of the course in computing your final grade will be: three exams @ 15% each (45%), problem sets (15%) and laboratory/discussion (40%).

APPROXIMATE COURSE SCHEDULE

Week	Lecture Topics	Book Chapters
1	Intro, Units, Sig Figs	0,1,3
2	Methods (gravimetric, volumetric, spectrophotometry)	7,18,27
3	Errors, Statistics	3,4
4	Statistics, Spectrophotometry	4,18
5	Spectrophotometry, Fluorescence	18,20
6 (Exam I)	Equilibria	6,8
7	Acid-base	8,9
8	Acid-base	9,10
9	Acid-base titrations	11
10	Titrations, Systematic treatment	10,11
11 (Exam II)	Activity, EDTA, Chromatography, solid-phase extraction	8,12,23,28
12	Chromatography	24,25,26
13	Redox, Electrochem, ***Thanksgiving!***	14,15
14	Electrophoresis	26
15	Mass Spectrometry	22
(Exam III)		