

Chemistry 327: Fundamentals of Analytical Science

Fall 2017

Lecturer: Professor Lloyd Smith
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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*, Eighth Edition, by Daniel C. Harris, W.H. Freeman and Company, 2010.

Lab Manual: *A Manual of Experiments for Analytical Chemistry - Fall 2017*, Department of Chemistry, UW-Madison. Lab manuals will be sold in Chemistry room 1375 beginning Wednesday, September 6. WiscCard purchase only—NO CASH SALES.

Lab Notebook: Carbonless laboratory notebook with numbered, duplicate pages. Alpha Chi Sigma (AXE), a professional co-ed chemistry fraternity founded here at UW-Madison, will be selling suitable lab notebooks in CHEM 1375.

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.

Personal Protection Equipment (PPE): Industrial quality eye protection is required at all times when you are in the lab. Indirectly vented 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 CHEM 1371. You're also required to wear a laboratory coat at all times in lab; lab coats will be available for WiscCard purchase in CHEM 1371 if you need one. You should transport you lab coat in a sealed plastic bag, such as a 1 gallon Ziploc. **Students requiring special accommodations in lab should contact the laboratory director, Dr. Pam Doolittle (pam.doolittle@wisc.edu) before the first lab meets.**

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 10, 1:20-2:50 PM (Room to be determined)

Exam II: Tuesday November 14, 1:20-2:50 PM (Room to be determined)

Exam III: Thursday December 21, 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)	17,26
3	Errors, Statistics	3,4
4	Statistics, Spectrophotometry	4,17
5	Spectrophotometry, Fluorescence	17,19
6 (Exam I)	Equilibria	6,7
7	Acid-base	7,8
8	Acid-base	8,9
9	Acid-base titrations	10
10	Titration (cont)	10
11 (Exam II)	EDTA	11
12	Redox, <i>Thanksgiving!</i>	13,14
13	Electrochem	13,14
14	Chromatography	22,24
15	Chromatography, Electrophoresis	24,25
(Exam III)		