

CHEM 2080 4.0 *Analytical Chemistry*

Course Director: Dr. Robert McLaren
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Office Hours:
M,W, F @ 11:30-12:30pm OR
by appointment

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Grading:	Tests (3)	45 %
	Pop-quiz	5%
	Labs	30%
	Final Test (cumulative)	20%

Important Dates:

Classes:	May 01 - Aug. 04
Tests:	May 26, June 28, July 26, Aug 04 (Final test – 2 hour)
Labs start:	Tues May 02
No classes:	May 22 (Victoria Day), July 03 (Canada Day) May 29 – June 02 (York Congress 2006)

Textbook:

Quantitative Chemical Analysis – 6th edition, Daniel C. Harris, Freeman, 2003.

Laboratories

The laboratories are a central part of the course.

- lab manual available this week from lab coordinator.
- safety glasses, lab manual and hardcover databook are a must for first lab!
- read each laboratory in advance and be prepared!

Lab Coordinator - Carolyn Hempstead, 360 CB

- all laboratory conflicts & problems go through Carolyn.

Marking – the marking scheme is outlined in the manual. In part, you will be marked on the quality (accuracy) of your work through the quantitative analysis of unknowns. You must learn careful laboratory procedure to perform well in the lab, and thus to achieve high marks in the lab portion of the course.

Chemistry 2080 4.0 Course Outline

Topic	Chapters in Harris (# lectures)
1) Introduction to analytical chemistry	0-2 (3)
• qualitative and quantitative analysis	
• the analytical method	
• units	
• tools of the trade	
2) Errors and statistical analysis	3-5 (6)
• precision and accuracy	
• types of error	
• standard deviation, variance and normal distributions	
• confidence intervals and tests of significance	
• linear regression, calibrations and figures of merit	
• quality assurance	
3) Gravimetric methods of analysis	27 (3)
• properties of precipitates	
• theory of precipitation	
• applications of gravimetry	
4) Equilibrium in Solution	8-11 (6)
• acids and bases	
• equilibrium constants	
• activity	
• solubility	
• complex systems	

Outline - Cont'd

Topic	Chapters in Harris (# lectures)
5) Titrimetric methods of analysis	
• Acid Base titrations	12 (4)
• Precipitation titrations	7 (2)
• Complexation titrations	13 (2)
• Redox titrations	16 (2)
<i>For each of the above titrimetric methods, we will discuss reactions, effect of equilibria, theoretical titration curves, endpoint detection methods, applications and examples.</i>	
6) Introduction to Spectrophotometry	19 (2)
• properties of light	
• Beer-Lambert Law	
• single beam instruments	
• deviations from Beer's Law	
• calibration methods	
7) Potentiometry	15 (2)
• pH electrodes	
• ion selective electrodes	
- <i>additional material will be given in the course that is not necessarily included in these chapters.</i>	