QUANTITATIVE CHEMICAL ANALYSIS SYLLABUS

Instructors:	Joel M. Harris		Lecture,	TH 12:30 PM - 1:20 PM
	1304 HEB, B157 HEB,	801-581-3585,	<u>harrisj@c</u>	<u>hem.utah.edu</u>
Lab Sect. 2,	MW 1:00 PM - 5:00 PM	James Davidsor	n, <u>jvdavids</u>	on@chem.utah.edu
Lab Sect. 3,	TH 1:30 PM - 5:30 PM	David Bryce, b	ryced@che	<u>em.utah.edu</u>

Lab Sect. 4, MW 5:00 PM - 9:00 PM Art Quast, <u>quast@chem.utah.edu</u>

Textbook: Quantitative Chemical Analysis, 7th Edition, by D. C. Harris Freeman: New York, 2006. Supplemental text material: <u>http://bcs.whfreeman.com/qca7e/default.asp?</u>

Course Website: https://utah.instructure.com/courses/245934

Grading:

<u>Lecture</u>		
	Problem Sets	125
	Hour Exams (2 at 100 points each)	200
	Final Exam (comprehensive)	200
	Subtotal	525
Laborate	vrc	
	Experiments 1 - 8	220
	Preparation and Lab Citizenship	50
	Special Project Abstract	30
	Special Project Proposal	100
	Special Project Oral Presentation	25
	Special Project Report	<u>100</u>
	Subtotal	525
Grand T	otal	1050

<u>Academic Honesty</u>: Analytical Chemistry is a subject where honesty in measurements, reporting of data, uncertainties, and errors is crucial. The results of analysis are used in environmental assessment (affecting the health of the planet), clinical diagnosis (life and death decisions), and legal questions (where fortunes may be at stake). As a result, this course cannot be tolerant of any dishonesty or cheating, because you are studying to become an accurate and honest analytical chemist. Therefore, your homework and exams must represent your own work; your laboratory writing assignments must be written in your own words and not copied from other sources (that's plagiarism). Violations of these principles and rules are subject to severe sanctions, according to the University of Utah Student Honor Code: http://www.admin.utah.edu/ppmanual/8/8-10.html

LECTURE SCHEDULE

Date	Chapter [*]	Topic
8/27		Class organization and requirements
8/29	0,1	Introduction to Chemical Analysis
9/3	3	Errors in Measurements, Propagation of Uncertainty
9/5	4	Coping with Random Error (distributions)
9/10	4	Interpreting Data from a Few Measurements
9/12	5	Linear Least Squares, Calibration Methods
9/17	28	Sampling and Standards
9/19	6,8	Quantitative Chemical Reactions and Equilibria
9/24	9	Acid-Base Reactions and Equilibria
9/26		Catch-up and review session
10/1		Hour Exam 1 (in class)
10/3	9	Acid-Base Equilibria, Graphical Methods
10/8	10	Polyprotic Acids, Bases, and Buffers
10/10	7,11	Acid-Base Titrations
10/22	12	Metal-ion Complexation Reactions and Titrations
10/24	14	Oxidation-Reduction Reactions
10/29	14	Electrochemical cells
10/31	16	Redox Titrations
11/5	15	Potentiometry and ion-selective electrodes
11/7		Catch-up and review session
11/12		Hour Exam 2 (in class)
11/14	18,19	Spectrophotometric Methods of Analysis
11/19	18,20	Introduction to Spectroscopy
11/21	21	Atomic Spectroscopy, theory
11/26	21	Atomic Spectroscopy, applications
12/3	23	Introduction to Chemical Separations
12/5	24	Gas-Liquid Chromatography
12/10	25	High Performance Liquid Chromatography
12/12		Catch-up and review session

12/18 WEDNESDAY, 10:30AM - 12:30PM Comprehensive Final Exam

^{*} Chapters refer to D. C. Harris (no relation), *Quantitative Chemical Analysis*, Seventh Edition Freeman: New York, 2006. ISBN: 0716770415.

Note: Homework is due at the beginning of lecture. Papers need to be submitted in class to be graded. E-mailed or FAX'd homework papers will be discarded. Late papers will be returned ungraded.

LABORATORY SCHEDULE

Week	M, T Activity	W, Th Activity	
9/2	Labor Day Holiday	Check -in, work on Excel Homework; see your TAs if you need help.	
9/9	Exp. 1. Review of Basic Operations	Exp. 1. Review of Basic Operations	
9/16	Exp. 1. Review of Basic Operations	Exp. 1. Review of Basic Operations	
9/23	Exp. 2. Applied Acid-Base Titrations	Exp. 2. Applied Acid-Base Titrations	
9/30	Exp. 3. Redox Titration of Iron in Ore	Exp. 3. Redox Titration of Iron in Ore	
10/7	Exp. 4. Spectrophotometric Determination of Iron in Vitamins (both periods)		
10/14	Fall Break	Fall Break	
10/21	Rotation of Exps. 5 - 8 Exp. 5 Ind	uctively-Coupled Plasma Emission	
10/28	Rotation of Exps. 5 - 8 Exp. 6 Ga	s Chromatography	
11/4	Rotation of Exps. 5 - 8 Exp. 7 Hig	h Performance Liquid Chromatography	
11/11	Rotation of Exps. 5 - 8 Exp. 8 Mu	Iticomponent Spectrophotometric Analysis	
11/18	Special Project	Special Project	
11/25	Special Project	Thanksgiving Holiday	
12/2	Special Project	Special Project, Check out	
12/9	Special Project Oral Reports	Special Project Report due	
Note:	Special Project Abstract due Tuesday, October 8, 12:30 PM (in class)		
Note:	Special Project Proposal due Tuesday, October 29, 12:30 PM (in class)		
Note:	Special Project Reports due in Friday, December 13, 5:00 PM (JMH Office)		