

Syllabus for Chem 212, Quantitative Analysis Fall Semester 2009

Quantitative Analysis, 3 credit hours; Prerequisite: Chem 106 or 102 and 112 and Chem 222 or Chem 224 and Chem 226 or permission of the instructor.

Instructor: Dr. Paul Chiarelli, Flanner Hall 102, phone 508-3106, E-mail: mchiare@luc.edu. Office hours Tuesday 1-2:30 PM and Wednesday/Friday 9:30-11 AM, or by appointment.

Textbook: "Exploring Chemical Analysis" (4th edition), by Daniel C. Harris, ISBN 1-4292-1004-4

Other Materials: You will need an inexpensive calculator having logarithmic (base 10 and base e), exponential, and trigonometric functions. Be sure you are familiar with your calculator and that it is in user-ready condition for quizzes and exams. **Calculators cannot be shared during exams and the covers must be removed while taking the exam.**

Objectives

- 1) To teach fundamental aspects of acid/base chemistry, electrochemistry, and ionic equilibria.
- 2) To acquaint the student with some of the fundamental techniques and state-of-the-art applications of chemical quantitative analysis used in biomedical, forensic, and environmental chemistry.

Grading: The total grade for the course is based on four 1-hour exams given over the course of the semester and one final. The lowest 1-hour exam score will be dropped. If you have to miss an exam due to illness or some other reason, this will be your dropped grade. If you miss another exam, then you must have a valid excuse (doctor's note) to have a make-up exam arranged. Each four hour exam is worth 25% of your grade (best three is 75% of total). The final is worth 25% of your total grade.

Scale: **A** 100-93; **A-** 92-89; **B+** 88-85; **B** 84-81; **B-** 80-77; **C+** 76-73; **C** 72-69; **C-** 68-65; **D** 64-57; **F** <56.

Homework: Students are expected to do the assigned problems in the back of the chapters in the textbook and study the class notes. If you are good about this, you will do well on the exams.

TENTATIVE CLASS SCHEDULE

Date	Day	Topic	Chapter
Aug 24	Monday	Introduction	3
Aug 26	Wednesday	Stoichiometry Review	3
Aug 28	Friday	Error and Statistics	4
Aug 30	Monday	Sampling	4
Sept 2	Wednesday	Statistics	4
Sept 4	Friday	Stat. Analysis of Data	4
Sept 6	Monday	Labor Day, No Class	
Sept 8	Wednesday	Stat. Analysis of Data	4
Sept 10	Friday	Exam 1 Statistics	3-4
Sept 14	Monday	Acids and Bases	8
Sept 16	Wednesday	Acids and Bases	8
Sept 18	Friday	Acid and Bases	8
Sept 21	Monday	Buffers	9
Sept 23	Wednesday	Titrations	9
Sept 25	Friday	Titrations	10
Sept 28	Monday	Polyprotic acids	10,11
Sept 30	Wednesday	Polyprotic acids	11
Oct 2	Friday	Exam 2	8-11
Oct 5	Monday	Midterm break; no class	
Oct 7	Wednesday	Complex Equilibrium	12
Oct 9	Friday	Complex Equilibrium	12

Oct 12	Monday	Complex Equilibrium and EDTA	12,13
Oct 14	Wednesday	EDTA and Chelation	13
Oct 16	Friday	EDTA and Chelation	13
Oct19	Monday	Test 3; Ch 12-13	
Oct 21	Wednesday	Electrochemistry	14
Oct 23	Friday	Electrochemistry; Cell Potentials	14
Oct 26	Monday	Electrochemistry;Ref Electrodes	14
Oct 28	Wednesday	Equilibrium Constants	14
Oct 30	Friday	Electrode Measurements	15
Nov 2	Monday	Electrode Measurements	15
Nov 4	Wednesday	Electrode Measurements	15
Nov 6	Friday	Test 4: Ch 14,15	
Nov 9	Monday	The electromagnetic spectrum	18
Nov 11	Wednesday	Absorption spectrometry	18,19
Nov 13	Friday	IR and UV/Vis spec	19
Nov 16	Monday	Luminescence	19
Nov 18	Wednesday	Immunoassays	19
Nov 20	Friday	Chromatography	22
Nov 23	Monday	Chromatography	22
Nov 25-27	Wednesday – Friday	Thanksgiving Break	
Nov 30	Monday	Mass Spectrometry	23
Dec 2	Wednesday	GC/MS	23
Dec 4	Friday	LC/MS	

Dec 7 Monday Final Exam 1:00 – 3:00 PM LSB 142