Syllabus for Chem 212, Quantitative Analysis
Fall Semester 2011

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/Thursday 1-2:30 PM and Wednesday 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.

Discussion Sections: Discussion sections meet once a week and will be held on Fridays from 8:15 to 9:05 AM in Cudahy 313 and 9:20 to 10:10 AM in Cudahy 202. On most Fridays, everyone will be expected to complete the problems on the handout provided. The instructor will demonstrate the first problem or a selected problem on the worksheet for the class. Then you will be expected to complete the worksheet problems and hand them in at the end of the session. These will not be graded. If you have made a good faith attempt to complete the whole problem set you will get 2 extra credit points on the next exam. You may work together in groups to achieve this. Discussion sections on Fridays when exams are held will be dedicated to review for the upcoming exam.

TENTATIVE CLASS SCHEDULE

Date	Day	Topic	Chapter
Aug 29	Monday	Introduction	3
Aug 31	Wednesday	Stoichiometry Review	3
Sept 2	Friday	Error and Statistics	4
Sept 5	Monday	Labor Day, No Class	
Sept 7	Wednesday	Sampling	4
Sept 9	Friday	Statistics	4
Sept 12	Monday	Stat. Analysis of Data	4
Sept 14	Wednesday	Stat. Analysis of Data	4
Sept 16	Friday Exam 1 Statistics		3-4
Sept 19	Monday	Acids and Bases	8
Sept 21	Wednesday	Acids and Bases	8
Sept 23	Friday	Acid and Bases	8
Sept 26	Monday	Buffers	9
Sept 28	Wednesday	Titrations	9
Sept 30	Friday	Titrations	10
Oct 3	Monday	Polyprotic acids	10,11
Oct 5	Wednesday	Polyprotic acids	11
Oct 7	Friday	Exam 2	8-11
Oct 10	Monday	Midterm break; no class	
Oct 12	Wednesday	Complex Equilibirum	12
Oct 14	Friday	Complex Equilibrium	12
Oct 17	Monday	Complex Equilibrium and EDTA	12,13
Oct 19	Wednesday	EDTA and Chelation	13

Oct 21	Friday	EDTA and Chelation	13
Oct 24	Monday	Test 3; Ch 12-13	
Oct 26	Wednesday	Electrochemistry	14
Oct 28	Friday	Electrochemistry; Cell Potentials	14
Oct 31	Monday	Electrochemistry;Ref Electrodes	14
Nov 2	Wednesday	Equilibrium Constants	14
Nov 4	Friday	Electrode Measurements	15
Nov 7	Monday	Electrode Measurements	15
Nov 9	Wednesday	Electrode Measurements	15
Nov 11	Friday	Test 4: Ch 14,15	
Nov 14	Monday	The electromagnetic spectrum	18
Nov 16	Wednesday	Absorption spectrometry	18,19
Nov 18	Friday	IR and UV/Vis spec	19
Nov 21	Monday	Luminescence.	19
Nov 23, 25	Wednesday– Friday	Thanksgiving Break	19
Nov 28	Monday	Immunoassays .	22
Nov 30	Wednesday	Chromatography .	22
Dec 2	Friday	Mass Spectrometry	22
Dec 5	Monday	GC/MS	23
Dec 7	Wednesday	LC/MS	23
Dec 9	Friday	Review for Final	
Dec 12	Monday	Final Exam 1:00 – 3:00 PM	