Chemistry 314 Instrumental Analysis
Spring 2015
Professor Alanah Fitch
Room 418, 83119, afitch@luc.edu

Description:
This is the capstone, writing intensive, service learning class for chemistry majors. This class is intended to integrate all core concepts from previous classes while simultaneously providing hands-on experience on common chemical instrumentation. The class can best be described as a "finishing class". Students leaving this class will be able to successfully survive a job interview for an industrial position and will be able to describe a research project for a graduate or medical school interview. The first 2/3 of the class are devoted to providing ***analytical thinking*** and ***professional*** training so that the student may solve a field environmental question related to lead with full quality control and assignment of uncertainty and validity to those results, as prepared by the student in the final 1/3 of the semester.

Textbooks:
Optional, in the years that I require the textbook students tell me that they didn't need it
In the years that I make the textbook optional students tell me that they did need it. You are now within 6 months of being a certified professional. Use your own discretion:
Skoog Holler and Crouch: Principles of Instrumental Analysis
Web source (exceptionally good): Analytical Digital Sciences Library
Very Useful: Robert de Levie: How to Use Excel in Analytical Chemistry or equivalent text.

Materials and Equipment to Be Supplied by the Student and brought to all classes

- Flash drive, pencils, calculator
- Lab-book with carbon tear out sheets
- Laptop computer with a database, preferably Excel (available through Open Office)

Responsibility of Students for Preparation and Cleanliness

- Students are expected to arrive with a working knowledge of the content of the assigned lab and be ready to begin promptly in order to complete the various tasks.

- *T.A.s will check the lab book to determine that each student has written a synopsis of the work to be accomplished.*

- Grades can drop if laboratory cleanliness is not adhered to. Each group is responsible for the cleaning of all lab ware used and to return the equipment to the appropriate space. If this becomes an issue the groups, semester grade may be lowered by a full grade.

Groupings and Schedule

In order to allow each student hands on access to the equipment each lab is split into 2 to 3 groups, each group having no more than 3 participants. The groups will follow DIFFERENT schedules throughout the semester as indicated on the next page.
2 labs deal with manipulation of data.

Working in groups is not easy. We expect you to make an honest effort to evaluate your own contribution and that of your partners to the group. At week three you will be given an opportunity to restructure. If an individual performs so poorly within a group that they are not "desirable" they will be expected to complete the work on their own with no decrease in the amount of work.

Grading

Grade	%	Points
A	90	900
B	80	800
C	70	700
D	60	600

Grades of + and – are assigned at the discretion of the instructor.

Point Accrual

Points	Activity	Comments
300	exam	3 @ 100
100	Presentation	
100	homework	
300	Group labs	6 @ 50
200	Executive Summaries	5 @ 40
1000	Total	

If an exam is missed for documented illness the two exams will be combined in a weighted average to make up for the missed exam:

(1.1) $$Exam_{3.missed} = 0.66Exam_{best} + 0.34Exam_{worst}$$

No make-up exams are given.

The "lecture" section is designed to move along as closely as possible with the work in the lab. Time is allotted in each lecture section to discuss concepts and data obtained within the lab, as a result each student is expected to come to class prepared to ask questions and discuss the material from lab. Students will be asked to present data as they have obtained it.
Lecture material made available as we proceed through the labs, below:

email	Coach Instrument Responsibility	Lab	Report Responsibility	Report Type	Revisions	Point Value
afitch@luc.edu	Alanah Fitch	Statistics	Group	Full Lab	Must be revised	50
afitch@luc.edu	Alanah Fitch	Digital filtering	Group	Full Lab	Must be revised	50
afitch@luc.edu	Alanah Fitch	Phone Spec	Single	Exec. Sum.	Must be revised	40
jmuscol@luc.edu	Jonathan Muscolino	UV-Vis	Group	Full lab	Can be revised	50
jdavidson@luc.edu	James Davidson	IC	Single	Exec. Sum.	Can be revised	40
jdavidson@luc.edu	James Davidson	IR	Group	Full lab	Can be revised	50
jmuscol@luc.edu	Jonathan Muscolino	Raman	Single	Exec. Sum.	No revisions allowed	40
jdavidson@luc.edu	James Davidson	AA	Single	Exec. Sum.	No revisions allowed	40
jmuscol@luc.edu	Jonathan Muscolino	ASV	Group	Full lab	Can be revised	50
jdavidson@luc.edu	James Davidson	GCMS	Single	Exec. Sum. Design	No revisions allowed	40
jmuscol@luc.edu	Jonathan Muscolino	Digestion	Group	Full lab	No revisision.	50

Date (Monday)	Week	Group 1	group 2	group 3	group 4	Exams	
12-Jan	1	excel statistics					
19-Jan	2	excel digital filtering					
26-Jan	3	Phone spec	UV-Vis	IR	Raman	Exam 1	Statistics and Digital Filtering
2-Feb	4	UV-Vis	IR	Raman	Phone spec		
9-Feb	5	IR	Raman	Phone spec	Uv-Vis		
16-Feb	6	Raman	Phone spec	UV-Vis	IR		
23-Feb	7	AA	ASV	GCMS	Digestion	Exam 2	UV-Vis, calibrations, IR, Raman
2-Mar							
9-Mar	8	ASV	GCMS	Digestion	AA		
16-Mar	9	GCMS	Digestion	AA	ASV		
23-Mar	10	Digestion	AA	ASV	GCMS		
30-Mar							
6-Apr	11	field sampling				Exam 3	AA, ASV, GCMS, Digesions
13-Apr	12	Analysis					
24-Apr	13	Presentations				Presentations all week during "lecture and lab"	

Saturday: May 2, 4:15 p.m. Final

Fitch Schedule (and office hours)

Time	Monday	Tuesday	Wednesday	Thursday		Friday
8:30				Lab Rm 315 Flanner		
10:25						Univ. 102 Sullivan 201
11:15						
11:30		Chem Seminar			Chem Seminar	**Office Hours**
12:20						
12:45						
1:40				**Office Hours (1:40- class)**		Lab Rm 315 Flanner
2:30		Lecture Rm 105 Flanner		Lecture Rm 105 Flanner		
3:45						
5:30						